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Preface

For the last three years, I have devoted myself to the designing and programming of *Battlehawks 1942*, *Their Finest Hour: The Battle of Britain* and *Secret Weapons of the Luftwaffe*, each an air combat simulation based on a pivotal period of World War II aviation history. The creation of these simulations has fascinated me; it has consumed me. As is evident to any history student or aviation buff, the history of World War II provides unending tales of courage and tragedy that range from the best to the worst our species can be. Through it all, I have come to have a deep appreciation and respect for the men who were involved in these larger-than-life events and for the aircraft they flew. Let us not forget who they were and what they did.

My aim in creating these simulations has been to build an historical laboratory that is accurate, richly detailed, and open ended. This laboratory is a world of exploration, one of freedom, of history, and, above all, fun. Early on in the development of these simulations it became fundamentally important to maintain objectivity especially when dealing with the extremely sensitive subject of war. By creating simulations that could be viewed from both sides and multiple perspectives, I have tried to be even handed and nonjudgmental in building these worlds of history. Ultimately, it is the player who learns the lessons of history for himself and draws his own conclusions by re-enacting the great dogfights and remaking the great strategic decisions of these dramatic times.

What intrigues me most about this period is the way history develops on an epic scale as well as a personal one. Each of the many different stories of World War II is at once intriguing, heroic, tragic, courageous and horrifying. It is these stories that need to be told and retold. That is why I was delighted to have Rusel and George undertake the huge task of creating this book. Rusel has done an admirable job of putting the day-to-day grind of aerial combat into perspective within the larger scope of the various air campaigns and the course of events of the war. I have been most pleased by his emphasis on the historical background and by placing each historically based mission of the simulation in its historical context. His richness of detail adds new depth to the events, machines, and men of these periods of history. Both Rusel and George have provided you with valuable tips and insights into the way the simulations function, and they have shown you new ways to enjoy and utilize these products. I applaud and thank them for their efforts!

During the development of these simulations computer technology has evolved at a tremendous pace; these constant changes in computer hardware have created new software challenges and possibilities. By combining these three simulations under one cover, this marvelous book also provides a mini-history of the evolution of computer simulations over the past three years. These breathtaking advances in computer performance and graphics continue unabated today. We are just at the humblest beginnings of creating exciting ways to experience and study the past through computer software. If the past is truly an indicator of things to come, then the future should be equally challenging and exciting.

—Lawrence Holland
November 13, 1991
Cloverdale, California

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Acknowledgements

There's no way to thank everybody adequately. This project began more than a year before it was finished. It didn't take as long as the war, but sometimes it seemed like it. During the course of reading about World War II, I came to believe that each person could be a book; that each event could be yet another book or three. In fact, I had to cut several chapters to prevent this thing from getting out of hand. (No... Really!) Needless to say, this book is just a start, but it still required the help of a lot of fine people. I hope I haven't forgotten anyone.

To begin with, I have to thank the great folks at Lucasfilm Games, past and present. Doug Glenn was the guy who said "Yes!" and got this whole book project started, but of course it was Larry Holland who created the games and who contributed in uncountable ways, despite his own "killer" schedule. Also, Tony Garcia, Betsy Irion, Sue Sesserman, Stacey Lameiro, Noah Falstein, Mary Bihr, Khris Brown, and so many more. Special thanks must go to Greg Hammond for exceptional help he gave us with strategies and to the testers, Tamlyn Niglio, Wayne Klein, Bill Burns, and Dave Maxwell. I also want to thank Victor Cross and Mark Shepard who not only willingly shared their resources and gave me a lot of help at different times, but whose outrageous manuals were my main inspiration when I began this project.

Other thanks has to go to the many people who helped me find information. Among them are Professor Williamson Murray, who gave this manuscript the once-over for historical accuracy; Bob Reynolds (RAF) whose stories and guidance helped get me started; Melissa Keiser from the Smithsonian; and Mary Beth Straight from the Naval Institute; not to mention the many people who helped me without necessarily giving me their names.

As usual, I have to thank the people at Prima—Ben (*especially Ben for putting up with my "perfectionism"*), Nancy, Nancy, Jennifer, Laura, Laurie, Roger, Helen, Tina, Scott—for their tireless help and for knowing when not to call. And also thanks to Robin at Bookman Productions.

In my own office, I have to thank Zach for doing some early proofing and for doing a lot of other work that would not have gotten done otherwise, and to Ocean for incredible accomplishments with renders and scenes, not to mention patience with me during the inevitable crises. Thanks to Sarah for being like an extra set of hands and eyes for me.

Finally, thanks to my family—to Marsha, Shan, and Max, and to my father, Donald, whom I thought of often when writing this.

—R.D.M, Nov. 1991

Personal thanks go to Greg Hammond for the hours he spent with me on the phone. I would also like to thank my wife, Paige, for her hours of support during this project, including her assistance in taking the fabulous screen shots found in the SWOTL mission strategies.

Finally, I would like to thank my co-author, Rusel, who kept me going even when things looked grim. I truly believe that his imagination and creativity touched everyone involved. Way to go Rusel! (*Thanks George.*)

I would like to dedicate this book to my father, Armand Fontaine. Dad, you're the greatest!

—George Fontaine, Nov. 1991

Special consideration must be given to the following companies and their exceptional products.: Apple, Radius, Pioneer, Adobe, Byte by Byte, Microsoft, Quark, CE Software, and Electronic Arts.

Introduction

This book is based on the outstanding computer simulation products created by Larry Holland for Lucasfilm Games. Those of you who are fans of these products already know how much they strive to be accurate and to provide an experience drawn from the history of the greatest conflict in modern times. In this book, Rusel DeMaria and George Fontaine have gone beyond the scope of the mere game and written a concise and insightful historical summary and analysis of the Second World War. In addition to revealing a great deal about these games themselves, Rusel has delved into the personal stories and the interweaving events of the war and has brought forth an informative and surprisingly insightful companion for the Lucasfilm simulations.

In the period before the outbreak of the Second World War, the prophets of air power argued that the arrival of the aircraft had fundamentally changed the nature of war. The next war, they argued, would be entirely dominated by strategic bombing attacks on enemy population and industrial centers. The bomber would even make armies and navies irrelevant and would allow those nations that recognized the potential of air power to win clear, decisive, and above all short victories that would involve none of the terrible attrition that had marked the conduct of the First World War.

In almost every respect their theories of air power were wrong except that strategic bombing did prove to be an essential factor in the victory of the Western Powers in the conflict that raged from 1939 to 1945. But air power could not and did not prove sufficient by itself to guarantee victory in the war. Only the combined effects of the efforts on land, at sea, and in the air enabled the Allied Powers to defeat of the Axis powers. Air power was to play a crucial role in victory in the Battle of the Atlantic against the German U-boat. Allied tactical air power interdicted the movement of German supplies to the Normandy invasion beaches and shut down the French transportation system, essential to the support of Rommel's hard pressed forces; it played an important role in helping Allied ground forces defeat the Germans in 1944 and 1945. The Allied strategic bombing offensive, both by day and by night, severely affected the ability of the German economy to utilize the industrial resources of the European continent; it was the decisive factor in destroying the Luftwaffe as an effective fighting force, which was an essential requirement for a successful landing on the Continent; it destroyed Germany's capacity to produce the petroleum products on which modern military forces depend; it caused substantial distortions in the distribution of German forces and caused the Germans to deploy massive Flak batteries to defend the cities of the Reich. It also led the Nazi regime to invest heavily in the V-2 rocket program, which wasted precious resources that could have been better utilized in other theaters; finally, the savage bombing of the German transportation system that began in September 1944 within four months effectively shut down the German economy and so prevented a final, desperate struggle in the wreckage of the Reich's cities. In the Pacific war American naval and land based air power broke the back of the Japanese air forces by spring 1943. Thereafter, American amphibious forces placed the Japanese in an increasingly untenable position, until by

1945 the Japanese nation resembled a punch drunk light-weight boxer, blinded by the pounding that he had taken, his arms dangling uselessly at his side, and absorbing terrible, endless blows from a heavy weight. The dropping of the two atomic bombs finally persuaded the Japanese military to end a conflict that was threatening to destroy their entire nation.

Nevertheless, whatever the crucial contribution of air power to final victory in the war, that victory was purchased at a terrible cost by the air forces that fought through to the end. The air war was nothing like the optimistic picture portrayed in pre war arguments. In every respect it was attrition war and victory went to the powers who had recognized the crucial importance of production and logistics early in the conflict. In 1940 and 1941 the British, and particularly the Americans, cast great production programs that enabled them to swamp the German air defenses in 1944. On the other hand, the Germans, betrayed by an overconfident belief that they had won the war by defeating the French in May 1940 and that the Soviet Union represented no serious difficulty to the operational brilliance of the Wehrmacht, failed to mobilize the resources of the European continent. Defeat in front of Moscow in December 1941 forced them to alter their strategic and economic misconceptions, but by then it was too late, for the Anglo-American powers held an unbeatable lead in time.

The air battles, particularly in 1943, nevertheless, proved to be very bloody affairs indeed. How bloody might best be suggested by noting that a young German had a better chance of surviving the Second World War if he joined the Waffen SS and fought on the Eastern Front for the remainder of the war than if he joined the Luftwaffe and flew as a fighter pilot beginning in 1943. On the other hand a young American had a better chance of surviving the war unmarked if he joined the Marines in 1942 and fought on a number of the island campaigns than if he joined the arm air forces and flew with the Eighth Air Force in B-17s in summer and fall 1943. Ironically, the conduct of air operations in the war resembled the strategy of World War I except that attrition came in terms of aircraft and aircrews rather than in mud-stained infantry. Month after month, year after year, crews climbed into their aircraft to fly over the European continent. And victory or defeat was a matter of statistical measurements of aircraft and crew losses.

Yet the air war was also determined by the classic rules that had determined victor or defeated in land or naval combat. As one commentator has noted:

> "Thus we are left with one clear reminder of a painful truth: The laws of war applied as much to the strategic air offensive waged over Europe's skies through five-and-a-half bitter years as they did to the sailors and soldiers on the distant seas or in the mud and sand below. Occasionally, the airman may have felt himself living and fighting in a new dimension, just as the air force commander may have sometimes felt he enjoyed a freedom of manoeuvre denied to admirals and generals. But the airmen died, and the air force commander was defeated, and stalemated unless the laws were kept. When they were kept, success came; until they could be kept, hope was kept alive by courage alone." (Anthony Verrier, *The Bomber Offensive*, p. 327)

—Professor Williamson Murray, Nov. 1991

PART I
THE BATTLE OF BRITAIN

I wondered idly what he was like, this man I would kill. Was he young, was he fat, would he die with the Führer's name on his lips, or would he die alone, in that last moment conscious of himself as a man? I would never know. Then I was being strapped in, my mind automatically checking the controls, and we were off.

Richard Hillary, **The Last Enemy**

Chapter 1
Prelude to War

The information given in this chapter, and, in fact, throughout this book, is necessarily brief. It is simply a partial summary of a large and complex period of history. We've offered these historical summaries to set the stage for the events that take place in the three simulation products that are the subjects of the book. We hope you will enjoy the background information as well as the strategies for flying Lucasfilm Games' fine simulations. We make apologies in advance for any specific omissions. There were simply too many events in World War II to chronicle them all in a book of this scope. We do believe, however, that the information on the following pages will enhance your enjoyment of the games you play and the missions you fly.

THE ADVENT OF AIR COMBAT AND EVENTS LEADING UP TO THE BATTLE OF BRITAIN

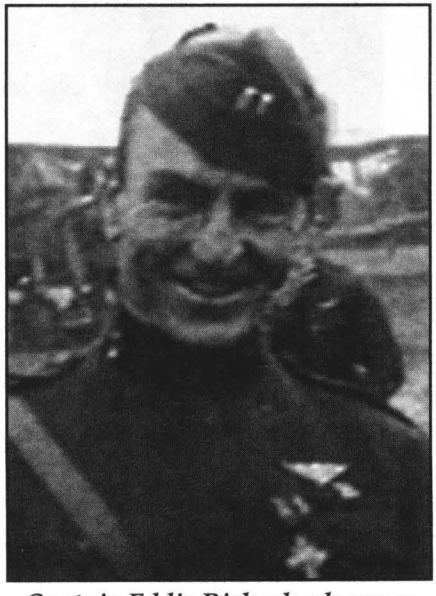
Once man found wings, it was inevitable that he would also find a way to fight from the air. Such is the nature of man—at least up to the Twentieth Century. The development of flying machines brought a new era to human conflict. From **Victory Through Air Power**, published in 1942: "Since world empires have depended throughout history on the available weapons of domination, the advent of this new weapon—swifter and more destructive than any in the past, equally potent on land or at sea—must affect fundamentally the pattern of life on our planet. It has already, indeed, gone far toward smashing the accustomed power designs and toward sketching the future picture."

The airplane was first used in the Balkan war of 1912-1913, but it was in World War I that it first played a significant, though perhaps not a critical role. Almost immediately, though, the concept of the air ace came into being and some

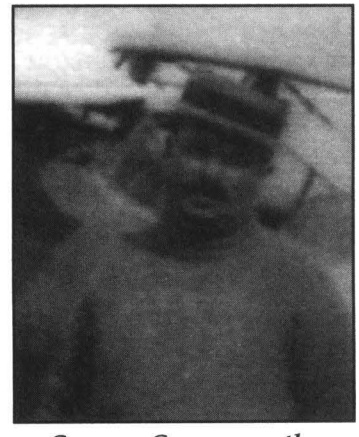
Max Immelman was one of the pioneer fighter pilots.

pilots assumed a larger-than-life image. There were luminaries such as Max Immelmann, Oswald Boelcke, and Manfred Von Richthofen himself, the Red Baron of the skies! The Allies countered with Georges Guynemer, Rene Fonck, Albert Ball, Billy Bishop, and Eddie Ricken-backer. These pilots, flying in relatively slow biplanes and triplanes, were to set the stage for later aviation. They each had a dynamic effect, and it was their special skill as pilots that earned them such legendary status. "Aero-dynamically and structurally the planes we flew in that war were primitive. In such essentials as speed, load-carrying capacity, and striking power their performance was low. To the physical hazards involved in piloting these early machines must be added the mental strain induced by the awareness that we had no parachutes and that we had no chance of escape from a burning or crippled plane. Yet the meager scope permitted by that stage of aviation was utilized to the limit." Other pilots have reported that they feared losing their wings more than they feared the enemy's machine guns.

Baron Manfred von Richthofen, the Red Baron, was one of the deadliest World War I aces.



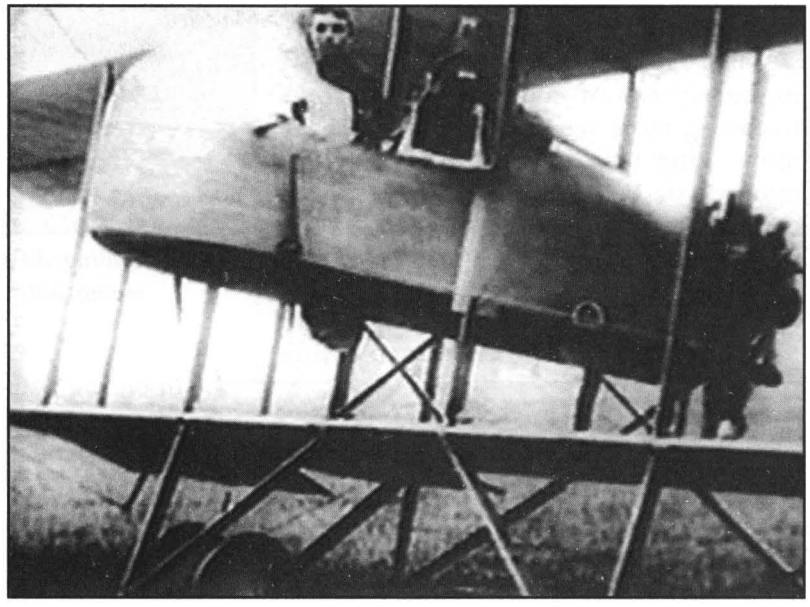
Captain Eddie Rickenbacker was the top-scoring American ace of WWI.



Georges Guynemer, the French Ace.

Fighters and Bombers

Airplanes quickly became important for their ability to "see" everywhere. Reconnaissance was an obvious use, and, in the early days, ground strafing could be a very effective weapon as well. Aerial battles—dogfighting—became a challenge very much akin to the jousting of the medieval knights. The code of chivalry was alive and well among combatants in the air, and the test of skill and daring, while deadly, soon became romanticized. Biplanes had replaced horses and machine guns had replaced lances.

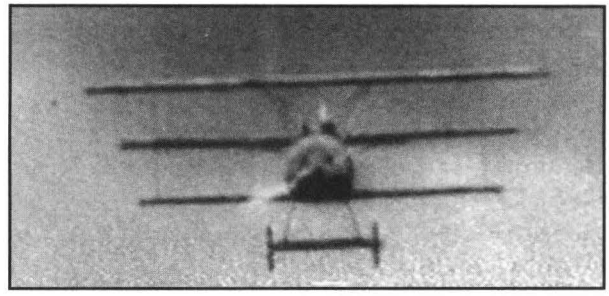


An early reconnaissance plane.

The prevailing opinion of the day was that fighter planes, to be successful, must have a high rate of climb and a very tight turning circle. Biplane dogfights involved turning inside your opponent to gain the advantage. Due to the light construction, slower speeds, and reduced wing loading (basically the ratio of weight against wing area) this strategy was consistent with the aircraft of the time. The time of the biplane was rapidly drawing to a close, however, though many aviation experts and pilots had not yet realized it. The day of the monoplane was coming. Some experts at this time believed the biplane to be a superior design. After

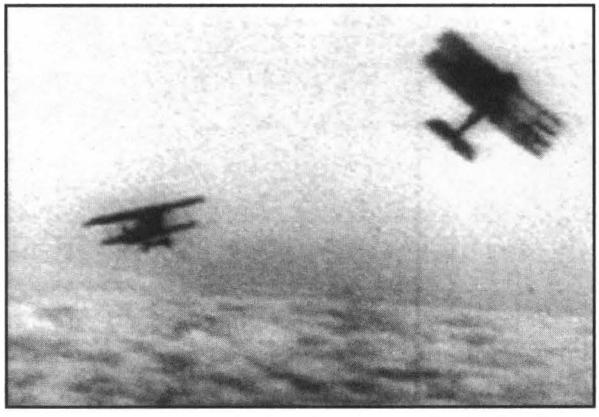
The Sopwith Camel was one of the most effective fighter aircraft of WWI.

all, they reasoned, the monoplane would not be able to turn as tightly, it would carry a higher wing load, and would require stronger landing gear to sustain it on the higher speeds of takeoffs and landings (meaning more weight and consequently more wing loading). They based their opinions on the prevailing theories of air combat. They were soon to change their theories, however.

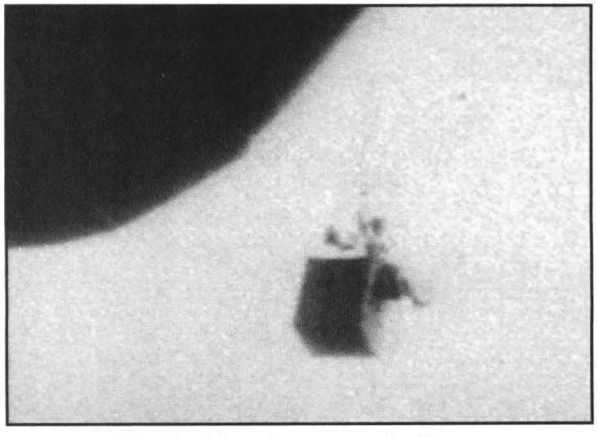


The tri-winged Fokker was one of the most memorable WWI fighter planes.

Less romantic, but potentially more devastating was the bomber—a seemingly unstoppable force raining destruction upon the helpless victims on the ground. There was no chivalry inherent in the bomber, but there was the possibility for complete domination of ground and sea forces. The role of the bomber was just being explored and theories about the bomber, developed during the First World War, were to have a profound effect on the events of World War II.



Early dogfights took place between relatively slow, but highly maneuverable biplanes and triplanes.



The first bombers were balloons.

During the First World War, bombing missions were not terribly important. They did cause a special kind of terror among their victims, but in terms of actual destructive power, they did little to affect the outcome of the war. However, they did enough to inspire a new philosophy of air combat. A chief proponent was Italian general Giulio Douhet, whose philosophy was often summed up in the statement, "The bomber will always get through." This simple credo became the refrain of many military experts like General William (Billy) Mitchell in the U.S. (though Mitchell also advocated defeating enemy fighters, too) and, perhaps more significantly for the immediate future, Lord Hugo Trenchard, Chief of Air Staff in England from 1919 to 1929, who helped maintain the RAF as an independent service arm during the years of his tenure.

The "Douhet doctrine" implied that there was no defense against bombers; that

they could range at will and drop their deadly cargo wherever and whenever they liked. According to the proponents of this idea, countries might build strong walls to surround themselves and protect their land, but they had no "roof." The air was always open above them. The only defense was a stronger bomber force with which to attack the enemy and blow him up first. This was the prevailing opinion in many military circles in the years preceding World War II and even during it. An analogy would be two boxers who had absolutely no defense, but who bombed away at each other with devastating hooks, uppercuts and right crosses until only one was standing. Something like a Rocky movie.

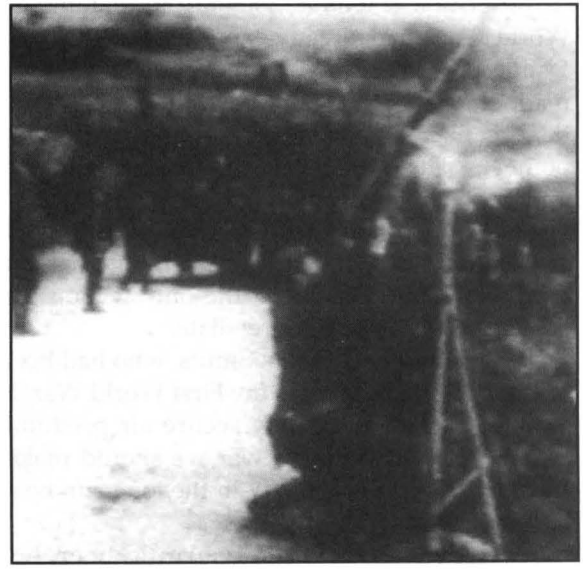
There is a defensive science in boxing, however, and there was a defense against the bomber, too. This defense was first demonstrated late in World War I in the fighter protection of London, but seemed to have been ignored by proponents of Douhet's theory. In one of history's ironic moments, it was championed by an unexpected source—one Sir Thomas Inskip whose appointment as Britain's Minister for the Co-ordination of Defense has been described by one author as "the most surprising since Caligula made his horse a consul." But whatever Inskip's credentials or popularity, he realized several important facts.

First, Germany was gearing up for a short war. The Nazis wanted to deliver a quick, decisive knock-out blow. On the other hand, England needed to be prepared for a drawn-out war, which in the long run would favor them, especially if they could get help from the Americans. (Inskip also reasoned, incorrectly, that the British naval superiority would play a big part in a longer war.)

Second, the British were losing the race to build a bomber force. The Germans were ahead, so, if Douhet was correct, Britain was going to lose the confrontation on the basis of bomber strength.

Third, and this was the most important reason, it cost much less to build a fighter than a bomber, so more fighters could be put in the air for the same cost. If a defensive battle must be fought, the fighter was going to be the chief combatant. And with the advent of the superior Spitfire, this fighter defense seemed even more feasible. Now the British had a fighter with the speed, maneuverability, and offensive power to destroy the German bombers and go head-to-head with the redoubtable Messerschmitt 109.

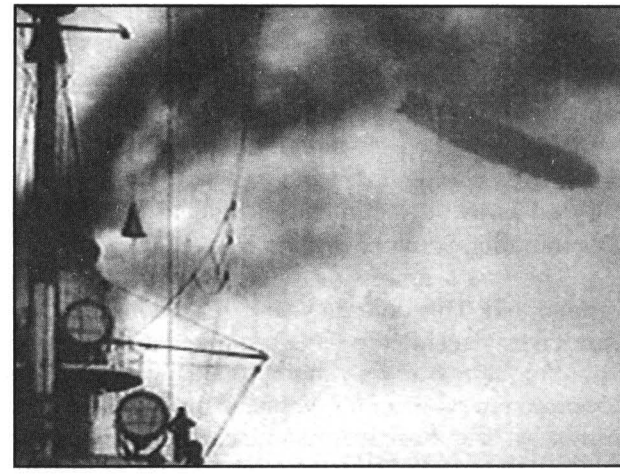
Added to these arguments were the technical advances in radar that promised to show where and when the bombers were attacking early enough to allow the fighters to intercept them before they reached their targets. Over the objections of his opponents in the British high command, Inskip was able to get support for his policies.



Early anti-aircraft guns were little more than machine guns mounted on tripods.

Inskip's contribution to Britain's subsequent victory in the Battle of Britain is less well recognized and is, in fact, disputed by some authorities who contend that he simply delayed the development of the British bomber force and thereby allowed Hitler the initiative in the early parts of the war.

Whatever his role, few question the importance of Sir Hugh Dowding who became the head of Fighter Command in 1937. Dowding also saw, correctly, that the fighter forces would be essential in the defense of British soil, and that their chief aim would be to destroy and disrupt the bomber formations he knew would be filling the skies before long.



German WWI zeppelin.

Dowding's contributions to Britain's defense during the Battle of Britain are legendary and practically impossible to overstate. Though he was possessed of a temperament and personality that made him unpopular in some circles, he was unflagging in his dedication to his job. Though his popularity often suffered, Dowding has emerged as one of the visionaries and heroes of the Battle of Britain, and his contributions began years before the battle itself.

Not that it took a visionary to imagine the German threat. Those who had lived through World War I had already experienced the invasion of the air. The Kaiser's Zeppelins were clearly visible proof that the Channel could not keep out flying machines. The German bombers had made their presence felt by bombing London and other cities with near impunity in 1917. Only the organization and coordination of an effective fighter defense force had had any effect on the bombers. The daylight success of the fighters caused the Germans to switch to night bombing, and the British responded with increasingly effective defenses, though these were never as effective at night as they had been during the day. Still, it was a combination of ground control, ground defenses, and agile fighters that hampered the German bombing effort. This lesson was clear—to some. To others, the only response was, in accordance with Douhet, to "give it 'em back." In other words, to retaliate.

General Jan Christian Smuts, who had been largely responsible for the success and build-up of the British air forces in the First World War, had written with some prescience:

"We should not only secure air predominance, but secure it on a very large scale; and having secured it in this war we should make every effort and sacrifice to maintain it for the future. Air supremacy may in the long run be as important a factor in the defence of the Empire as sea supremacy."

Had General Smuts' warning been heeded, Hitler would never have been able to contemplate the total annihilation of the RAF as he did in 1940. But after achieving supremacy in the air in 1918, the British, though forewarned, dropped their air defenses to less than a handful of squadrons.

The people who had lived through the First World War could be expected to recognize the coming menace, but some people had seen the possibilities right from the beginning—even before the airplane had ever shot a gun or dropped a bomb. There is a story told about Lord Northcliffe, owner of the *Daily Mail*. He read a terse and unimaginative report of the first European airplane flight by Alberto Santos Dumont. The flight was reported as being only 722 feet in duration. However Northcliffe saw the real importance of this historic event. The importance of this story was "not that Santos Dumont flies 722 feet, but that England is no longer an island. It means the aerial chariots of a foe descending on British soil if war comes." This was in 1906.

Thus it was not really a surprise that the air would become a battleground. On that fact, most people agreed. Where they disagreed was in policy, and it was the vision and tireless effort of people like Inskip, Dowding, Churchill, Watson-Watt, Lord Beaverbrook, and others who combined to choose, in retrospect, the correct policy, often against much prevailing opinion and, in some respects, for idiosynchratic reasons of their own.

HITLER AND THE NAZI PARTY

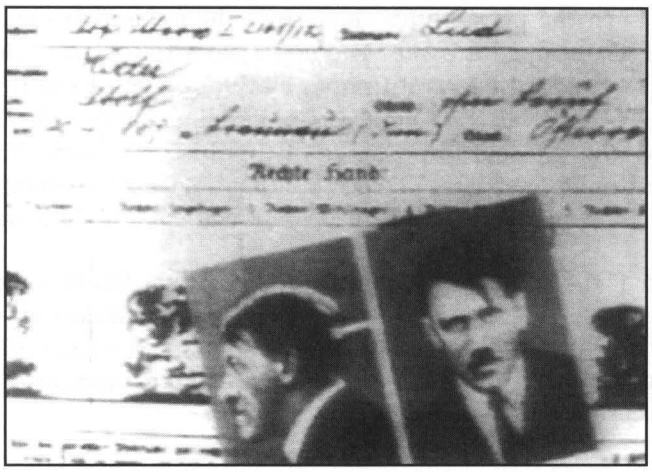
Hitler gained power in a country fragmented by war, devastated by economic collapse, and in a highly charged state of political unrest. From the beginning, Hitler and his Nazi Party used dissention and violence to further their ends, manufacturing riots and going out of their way to create disorder. They were masters of rhetoric and misinformation, and used Communists, Jews, and the bitterness of the Versailles Treaty as the scapegoats for their doctrine of hate and aggression.

Hitler had an unnatural hatred of Jews. This hatred and his warped theories of racial purity were to form the basis for his self-justification and the Party's propaganda mission as the Nazis rose to power. From the beginning of the Nazi era, a compulsion for conquest and domination drove Hitler, and he steered his power structure toward war without deviation.

Hitler, just getting started.

The Secret Luftwaffe and the Re-Mobilization of the RAF

In 1933 Adolf Hitler became the chancellor of Germany and he inherited a fledgling, but well-organized clandestine air force. With a secret training base in Russia, personnel were being trained and equipment tested in the utmost secrecy. In addition to the secret training and testing, Hitler's predecessors had found other ways to pave the way for a new air power. They encouraged the youth of Germany to engage in aviation as a hobby. Thus, many of Germany's air aces of the Second World War began as glider enthusiasts or flying small aircraft, and tens of



Hitler was an enigma. A failed art student, he went on to become a charismatic and persuasive orator, leader of the Nazi movement, and, eventually, the would-be conqueror of the world.

Ernst Röhm was a long-time associate of Hitler's-at one time the head of the Storm Troopers. He was liquidated in 1934 in a party purge.

Hermann Göring, a World War I hero, was another of Hitler's earliest supporters. He lent credibility to the fledgling Nazi Party and remained with Hitler to the end. During World War II he headed the Luftwaffe.

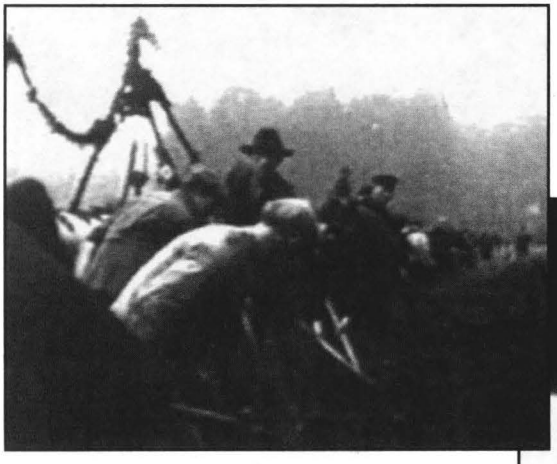
Paul Joseph Goebbels was the propaganda master who packaged Hitler and his views and sold them to the German people.

Heinrich Himmler was a scheming, cold man who took over the Gestapo and ran the police state as well as the concentration camps without regard for human life.

Von Hindenburg ruled Germany, but had to watch Hitler and the Nazis take power. By the time he died, the Nazis were in complete control.

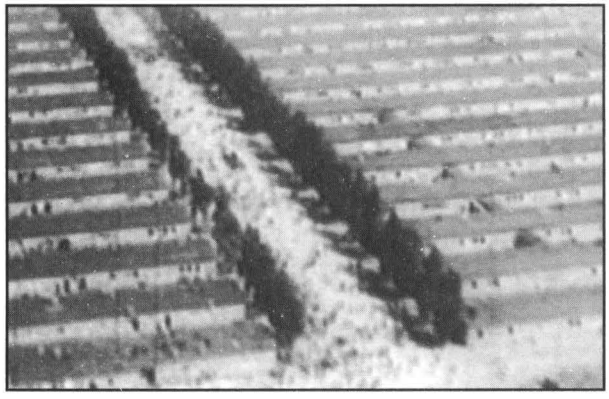
While Hitler raved on, inciting crowds and promoting his cause, a fire at the Reichstag gave him the justification to consolidate his power and do away with civil liberties.

While preparing for war, the Nazis put many people to work. The industrial effort benefitted the country and helped eliminate the rampant inflation and unemployment that had inflicted the German economy. Though the purpose was different, there was some similarity between this effort and the New Deal of the Roosevelt administration.



As part of the systematic policy of intolerance, the Nazis arrested dissenters and members of the intelligencia. They also encouraged book burnings to destroy records of non-Nazi thought.

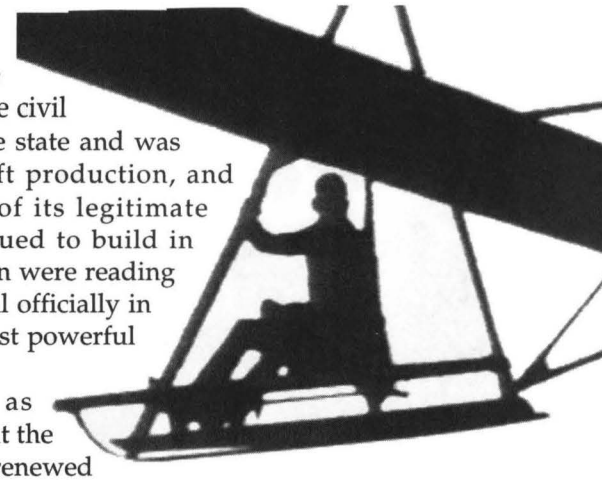
The Nazis began requiring Jews to wear yellow stars. They were forbidden to use public transportation and were systematically robbed of their civil rights. People were forbidden to deal with Jews and most Jewish businesses were marked with yellow stars, vandalized, and eventually closed.



As the persecution of Jews became more brutal, concentration camps like Dachau and Auschwitz were created.

People were murdered by the thousands, using just about every imaginable method.

thousands belonged to these clubs all over the country.



The other important cog in the machinery of the evolving Luftwaffe was the civil airline, Lufthansa, which was owned by the state and was able to perform training, sponsor aircraft production, and develop ground facilities far in excess of its legitimate commercial needs. The apparatus continued to build in secret (though analysts and experts in Britain were reading the signs correctly) until Hitler lifted the veil officially in March 1935. He claimed at that time the most powerful air force in the world.

Meanwhile, current events such as Hitler's rise to power and the knowledge that the Germans had a secret air force) had given renewed urgency to the expansion and modernization of the RAF. By 1935 Hitler had formally announced the existence of the Luftwaffe, and the expansion of the RAF was further increased, though to a still modest target of 112 squadrons by March 1937.

The Kondors in Spain

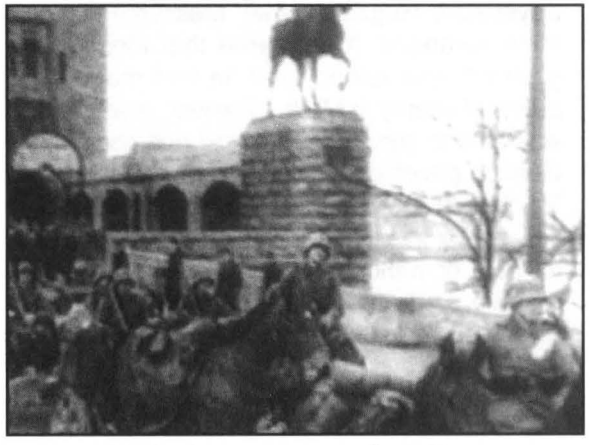
During the Spanish Civil War, another page in the history of air combat was turned. At the beginning of this conflict, the emerging Luftwaffe, trained and equipped in secret, supported Franco's fascist forces. The pilots and other German soldiers sailed into Spain disguised as *Strength-Through-Joy* tourists and by other surreptitious means. At first both sides were equipped with machines little improved from the World War I vintage craft. Their He 51 fighters enjoyed no decisive advantages over the enemy and were used largely for ground support. However, with the arrival of the Messerschmitt 109, a modern single-winged fighter, it became clear that with decisive equipment advantages, air superiority was easy to achieve. The Bf 109 was not only a dominant fighter plane, but was (with continual modifications) the chief German fighter from 1937 until the end of the Second World War in 1945. It was clearly the world's most advanced fighter in service in 1937 and was arguably the best fighter airplane of its era. The lesson of mechanical superiority was already understood by the pilots themselves, but it became all the more apparent to others who saw how quickly the Bf 109 asserted its dominance. As the Bf 109s attacked the more antiquated biplanes of the Loyalists, the superiority of the new fighters swung the advantage decisively in favor of the German pilots.

Galland and Mölders.

It was during the Spanish Civil War that many of the Luftwaffe's tactics for fighter warfare were developed. Great leaders and tacticians like Adolf Galland and Werner Mölders, wearing the uniforms of Spanish officers, got their first combat experiences in the Spanish skies, and they developed an understanding of tactics that was to serve them well in the beginning stages of World War II. In particular, they abandoned close formation flying, which was impressive to see and which fit adequately in an airshow, but which could be deadly in combat. In place of close formations, they developed the *rotte* and the *schwarm*—looser formations with the planes staggered and spread out to provide better visibility, more freedom in the air, and greater protection for the lead planes.

Blitzkrieg

The political ping-pong match that led to the start of World War II went on for some time. Everyone was virtually certain that Hitler would eventually begin his conquests, but most hoped to avert such an action through diplomacy. In 1936, even as Hitler defied the Treaty of Versailles and occupied the demilitarized left bank of the Rhineland, people were making apologies. Shortly after that, he began to talk about *'Lebensraum'* (living space) and the needs of the German people to expand, to regain lost territories, to colonize.



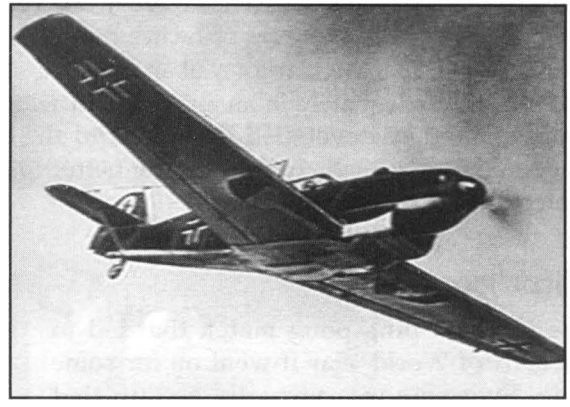
Hitler's troops cross the Rhine.

And then came Austria, and Hitler's vision of *Anschluss*—the unification of Austria and Germany. Though the idea was rejected by the Austrian government, Hitler marched into his native Austria on March 12, 1938. Immediately, Austria became part of Germany with minimal resistance; the debut act of the *blitzkrieg*. As it turned out, almost all the Austrians welcomed Hitler, as was evidenced by an April 10 vote which overwhelmingly approved *Anschluss*. The approval was so nearly total as to surprise even Hitler, whose self-confidence at this time was at a zenith and in whose lexicon the word defeat did not seem to exist.

Hitler's triumphant entry into Austria marked the culmination of* Auschluss*—the reunification of Germany and Austria.

The next stop was Czechoslovakia. Though Hitler's plans were to conquer the whole country, he took it a piece at a time,

Willy Messerschmitt and the Development of the Bf 109



The Luftwaffe's most successful fighter plane had to fight its way into existence. The story goes back to the late '20s when Erhard Milch was head of Deutsche Lufthansa (DLH) and he ordered several M-20 airliners from designer Willy Messerschmitt. Unfortunately for Messerschmitt, several M-20s crashed, one of them killing eight German officers to much attendant publicity. The repercussions of this tragedy led to the bankruptcy of Bayerische Flugzeugwerke, Messerchmitt's main company. It appeared that Messer-s2chmitt was ruined, and he had made a powerful enemy in Milch. However, a smaller subsidiary company, Messerschmitt Flugzeugbau, was able to survive the political and economic predations of Milch and others. Thus, when the German government secretly sent out specifications for a top-line fighter to replace the obsolete Heinkel He 51, Messerschmitt was reluctantly included in the list.

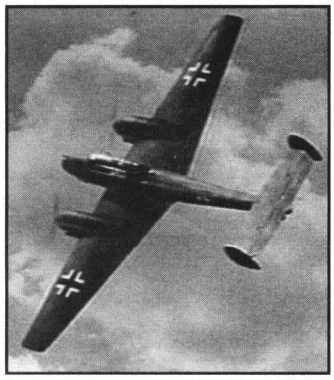
By this time, Milch was the Reich Commissioner of Aviation, and thus held great power to grant or withold contracts. He had previously assured Messerschmitt that he would never receive contracts to design any planes, but only to manufacture the designs of others. Messerschmitt survived largely by developing planes for customers in other countries.

However, when the call for a fighter came, Messerschmitt, like Camm and Mitchell in England, proved to have the vision and imagination to produce a fighter of superior qualities. He had previously created a two-seat all-metal monowinged sport plane that won several places in the Challenge de Tourisme Internationale of 1934. Thus, he was allowed to compete for the fighter contract, though he was privately assured that he had virtually no chance of getting it.

The plane he created in response to the German government's demand was the Bf 109a. However, Messerschmitt still got little encouragement as he showed the prototype to the former World War I ace Ernst Udet, who proclaimed that the slim aircraft would never make a fighter.

Messerschmitt never gave up, however, and his first Bf 109 took flight in September, 1934—months before the Spitfire took its maiden voyage. But, when his first chance came to demonstrate his creation to the government, a failure in the landing gear marred the performance of the plane. The front-runner for the contract was Heinkel's He 112, a heavy plane that boasted inferior characteristics in most circumstances. But politics still stood against Messerschmitt.

The situation changed over the next nine months, however. With some design modifications and a more powerful power plant, the Jumo 210a, the Bf 109V-3 was clearly a superior airplane. Furthermore, with news of the Spitfire's performance, the government began to look at the 109 as its natural enemy. Their performances were very close. Finally, in a test against the Heinkel, the 109 performed a series of tight maneuvers that the Heinkel pilot



declined to follow. It was clear that the Bf 109 (later Bf 109) was the fighter the Germans were looking for.

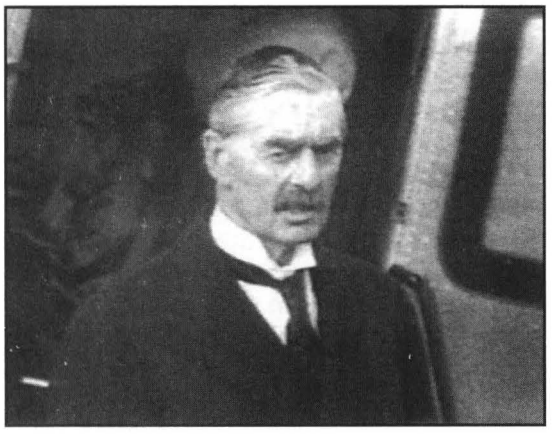
Later, the power plant was changed to the even more powerful Daimler Benz DB 601Aa 12-cylinder liquid cooled engine. The Bf 109 orginally had only three machine guns, and saw action first toward the end of 1936 in Spain where the "volunteers" of the Legion Kondor flew them and proved the new fighter's unqualified superiority. However, despite German propaganda to the contrary, there were very few Bf 109s in action in Spain, with only two *gruppen* using them, and neither operating at full strength. Where the Germans didn't have to exaggerate was in describing the complete dominance of this plane over its competition. Thus the 109 and its pilots were to get valuable combat experience long before the Battle of Britain, and long before either the Hurricane or the Spitfire was tested in battle.

By the time of the Battle of Britain, the Bf 109 had gained the Daimler Benz engine and new armament. The Bf 109E-3 Emil fighter was fitted with two 20mm MG FF cannons with 60 rounds each in the wings and two 7.29 mm Rheinmetall Borsig MG 17 machine guns, each with 1,000 rounds in the fuselage, designed to fire through the propellors. Some models had engine-mounted cannons, but these were largely unsuccessful, and the cannon mounting was not popular.

The newest 109 in service at the time of the Battle of Britain was the Bf 109E-4 of which there were several models. The E-4 model had faster-firing cannons, a higher performance engine that could deliver 1,200 horse power (and 1,270 h.p. for short bursts). In addition, there were two specialized models: a reconnaissance model mounted with a camera, and a fighter/bomber called the E-4/B Jabo which was mounted with a single, electrically released bomb rack.

The 109 was to prove a very durable design. It was in action throughout the war. More than thirty five thousand of them were produced, more than any other fighter, and they were still competitive toward the end of the war, although the P-51 was clearly superior late in the war despite many improvements to the 109. (Note: The Spitfire was also still competitive in the sense that its improvements continued to match those of the 109, but as the fighting moved deep into German territory, the P-51 became the dominant Allied fighter over Germany while the Spitfire continued to be used in other theaters. The rivalry between the 109 and the Spitfire, therefore, did not remain a significant factor throughout the war).

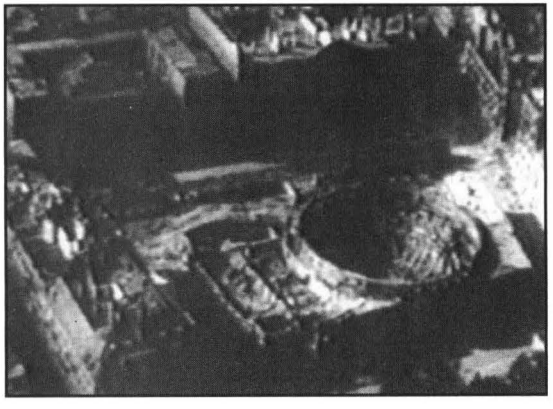
Willy Messerschmitt continued to produce fighters for the Luftwaffe. Some, like the Me 210 and the Me 410, performed poorly and were produced in limited quantities. The most notable of Messerschmitt's planes—in addition to the 109—were the Bf 110 'Zerstrorer', the Me 163 Komet, and the Me 262 twin-engined jet. Thus, although the Me 163 and the Me 262 entered the war too late to turn the tide, Messerschmitt produced most of the outstanding fighter planes the Germans had during the war, and proved himself to be perhaps the most advanced designer of his time. Of non-Messerschmitt fighters flying on the German side, only the Focke Wulf 190 gained much distinction.



British Prime Minister Chamberlain tried to avert war by appeasing Hitler.

Signing away Czechoslovakia.

starting with the German-speaking Sudetenland. Even now, people were seeking a way to avoid war. Hitler had carefully used propaganda to incite the Sudeten Germans. By this time it was clear that, after all, the Sudeten Germans wanted to be part of Germany. Hitler cast himself in the role of savior, releasing the oppressed Sudetens from their bondage. The world watched. Compromises were offered, and eventually the Czechs were forced to cede the Sudetenland—



Hitler eventually invaded Poland, finally setting off World War II. Had he expected to avoid the great conflict and pick away at Europe, or had he known that eventually he would go too far? Here, his troops are positioned outside Warsaw. Below, he surveys the damage to that city.

the outcome of a meeting in Munich attended by representatives of Germany, France, Britain, and Italy and presided over by Mussolini. No representative of the Czech government was present. Following Munich the word appeasement took on a negative connotation. But the annexation of the Sudetenlands wasn't enough for Hitler; he had never intended to stop there. Helped by Hitler's efforts, Czechoslovakia began to disintegrate as its own provinces sought autonomy while Poland and Hungary hovered across her borders seeking to settle old scores. Eventually, Hitler was able to march into Czechoslovakia as that country's integrity dissolved. Because Slovakia had declared its independence and had capitulated to Germany, leaders in France and Britain turned away from the Czechs and their obligations by treaty. Czechoslovakia was a lost cause; no one did anything to stop the German march of conquest. Now, as Hitler repositioned his sights on Poland, Britain and France vowed to protect that country.

On November 9, the persecution of the Jews escalated. This was the famous "Crystal Night"; so named because of the shattered glass of storefronts and synagogues. On this night, coldly planned in detail by the Gestapo, 267 synagogues were attacked, 815 shops destroyed, 36 Jews killed, and 20,000 arrested. Elsewhere, especially in Austria and Poland, persecution of Jews was escalating as well.

Orders for the Crystal Night

"Berlin No. 234404 9.11.2355
To all Gestapo Stations and Gestapo District Stations
To Officer or Deputy
This teleprinter message is to be submitted without delay:

1. At very short notice, *Aktionen* against Jews, especially against their synagogues, will take place throughout the whole of Germany. They are not to be hindered. In conjunction with the police, however, it is to be ensured that looting and other particular excesses can be prevented.

2. If important archival material is in synagogues, this is to be taken into safekeeping by an immediate measure.

3. Preparations are to be made for the arrest of about 20,000-30,000 Jews in the Reich. Wealthy Jews in particular are to be selected. More detailed instructions will be issued in the course of the night.

4. Should, in the forthcoming *Aktionen*, Jews be found in possession of weapons, the most severe measures should be taken. SS Reserves as well as the General SS can be mobilized in the total *Aktionen*. The direction of *Aktionen* by the Gestapo is in any case to be assured by appropriate measures.

Gestapo II Mueller

"This teleprinter message is secret."

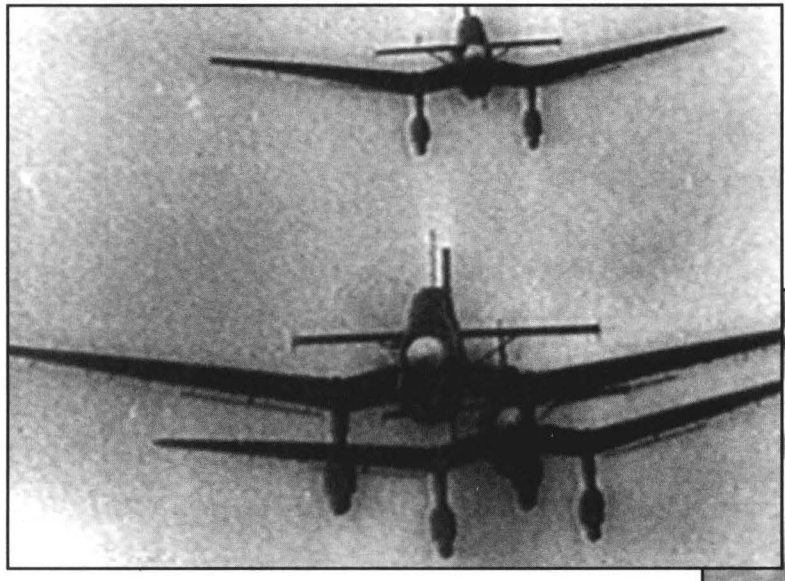
Are You Ready?

All through this pre-war period, Hitler was testing. He had taken chances, ever prepared to back down if the Allies stood against him. But they did not. He made numerous promises, and a hopeful world largely accepted them. He broke promises, and the world hoped he would be satisfied with this one new conquest and then leave well enough alone. Finally, when he attacked Poland, Britain declared war. But how prepared were the British to wage the war they had just entered?

Few people were ready to commit to a wartime economy, and the "business as usual" policy was kept in effect in Britain as a matter of governmental policy almost until they entered the war. This meant that production of fighters, bombers, and other war time resources had to proceed under normal working conditions. Had more severe measures been taken earlier, the RAF would have been better prepared when the conflict over Britain began in 1940.

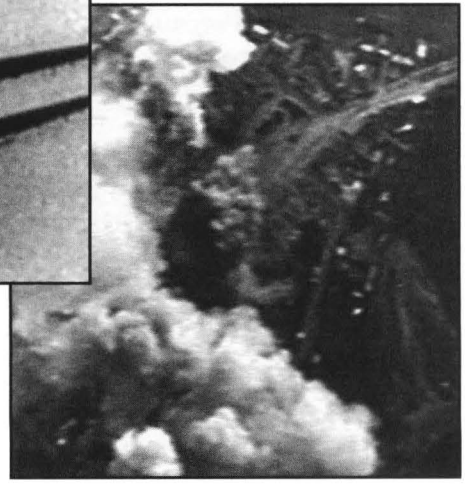
Britain and France had agreed to come to Poland's aid if the Germans invaded, but the blitzkrieg destroyed the Polish resistance before any help could arrive. The Polish air forces were destroyed largely on the ground by the Luftwaffe's devastating attacks.

When Britain finally had to abandon diplomatic efforts in the face of Hitler's continued treachery and his invasion of Poland, they declared war on Germany on September 3, 1939. France, India, Australia, and New Zealand likewise declared war.



One of the principal weapons of the Luftwaffe was the deadly Ju 87 'Stuka' dive bomber, whose pinpoint accuracy could destroy targets selectively, and whose characteristic whine from the dive brakes sent chills up and down the spines of those on the ground.

When Germany attacked Poland, the blitzkrieg decimated the Polish air force and marched into Warsaw so quickly, there was no time for the Allies to react.



The Balance of Power

The British defenses had been building up now for several years, and were in better shape than they had been previously. There were more squadrons of Hurricanes and Spitfires ready for defense, and the RDF (Radio Direction Finding) system was nearing completion. The techniques for guiding (or vectoring) the fighter squadrons to the enemy formations still had not been worked out.

The exact method used to send the fighters almost exactly to the point of interception with the attacking forces was unknown to the Germans and was to prove a decisive advantage for the overworked and outnumbered British. By always being in the right place at the right time, they appeared to be more numerous than they actually were. Still it was to be a year before the Battle of Britain finally began. And during that year, some important pieces of the puzzle would have to come into place. It was a race against time, though few, if any, knew how close the finish would be.

During that year, a united Britain worked to prepare for the worst. By now there was hardly an English man or woman who did not agree that Hitler must be stopped. This spirit of commitment was in part responsible for the incredible strength and resolve of the British in the months of the Battle of Britain and the following years of the war.

An example of the British resolve was related by Douglas Bader in his book **Fight for the Sky**. He recounts the story of a shopkeeper whose store has been destroyed by a crashing German bomber. "In front of him on the pavement was a

Churchill had been warning the Brits of the coming danger, but had been unable to alter the course of 'business as usual.' His chance came, finally, when Chamberlain declared war on Germany and then stepped down. Finally, Churchill was in charge. A brilliant orator and an inspiring leader, he was to guide England through the rest of the war.

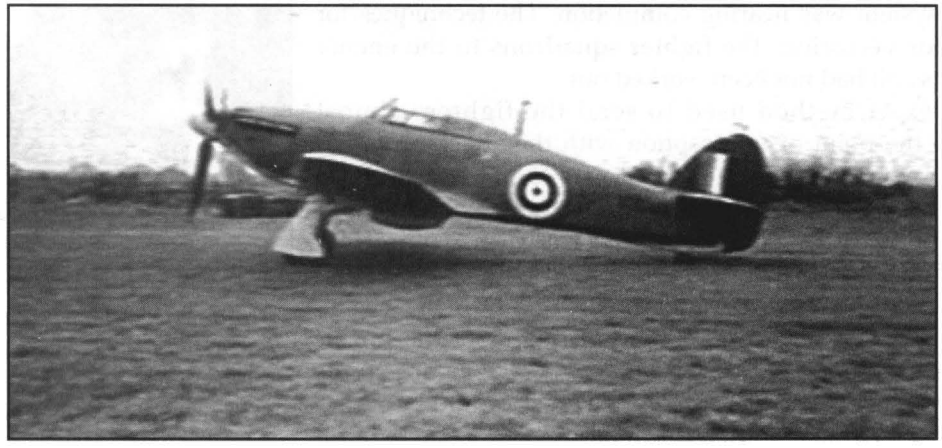
Keeping a watchful eye on the air.

Did They Know?

Some think that the Germans did know about the RDF system, but were unable to determine exactly how it worked. It is possible that the dirigible, the Graf Zeppelin, cruised up and down the British coast, but searched on the wrong wavelengths.

FIGHTER DEVELOPMENT

The Hawker Hurricane

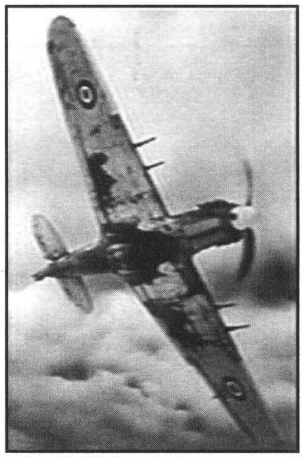


Sir Sydney Camm was the chief designer for the Hawker Aircraft Ltd. By 1933, Camm had already designed the Hawker Fury, a biplane with a top speed of about 250 mph. However, he was convinced of the limitations of the biplane. In August of 1933 he entered the office of Major Buchanan, then the British Air Ministry's Deputy Director of Research and Development. In his briefcase were the plans for a new type of fighter—the monoplane. However, even as his counterpart, Willy Messershmitt was obtaining vast sums of marks to develop his war planes, Camm met with the resistance of a peace-time government.

Hawker backed Camm, however, and privately continued the development of the airplane that was to become the Hurricane. Meanwhile, similar private efforts went into the development of the Rolls Royce Merlin engine, which was to become the most important fighter power plant of the war.

But pressures mounted in the government to find a better-performing airplane, and finally, in 1935, the British ordered one Hurricane (then called the Fury monoplane) for testing. Secrecy was absolute at the Hawker plant, and even Air Marshall Sir Ralph Sorley didn't know a thing about it. This was ironic because Sorley was advocating the use of eight Browning machine guns mounted in the wings of suitable aircraft. His opponents argued that the wings of a monoplane wouldn't be able to support such a battery and that four Vickers should be mounted in the fuselage. The Vickers was obsolete by then, however.

Sorley, still ignorant of the Hawker developments, 'borrowed a flyable, but obsolete, aircraft from the Air Ministry and shot it to ribbons with a 2-second burst from eight suitably mounted Brownings. Only after showing Dowding the results of his test was he told about the Hawker plane.



Camm wasn't exactly delighted to learn that he would have to mount eight heavy machine guns and ammunition in his creation. He was building a performance aircraft—state of the art for its day. The added weight and design requirements would not enhance the plane's performance. However, Camm was practical and Sorley persistant. The result was the design of the most powerful gun platform of its day.

With the added weight, the new airplane would require a powerful engine. And fortune must have been smiling on Camm, because the Rolls Royce Merlin engine was completed just when it was needed. Boasting an amazing 1,025 horse power, it could speed the new Hurricane, as it came to be called, at 330 mph, a full 80 mph faster than existing fighters of the time!

The first test of the Hurricane occurred on March 6, 1935, and it handled like a dream. Only years afterwards, Sydney Camm admitted, "When the design of the Hurricane had gone beyond the point of no return I suddenly had a forboding that it would be no good. I was always a worrier. Sopwith, Sigrist, Bulman and I had all decided that strength should be an important factor in this ship, but I always had one regret.

"I wished the wing had been thinner. If we had had more time it would have been the greatest aircraft of all time. As a matter of fact, I felt that the Hurricane was already somewhat outdated back in 1937. Yet if we had not gone ahead we should have had nothing when we went to war with Germany."

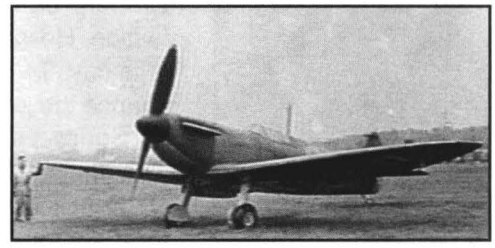
It is said that the Hurricane made its first Luftwaffe 'kill' before the war between Britain and Germany had officially started. The place: A big international air show at Brussels. The time: July 1939. Hitler had already taken Austria and Czechoslovakia and was threatening Poland. The war was about to begin, but there was still a semblance of peace.

The Hurricane, despite almost having to scuttle the flight, performed beautifully under the control of Hawker test pilot Dickie Reynell. Executing a fantastic takeoff, loops, spins, and tight turns, the Hurricane stole the show. At the height of an outside loop, suddenly flame belched from the tail of the plane, causing consternation among the German and Italian observers. Did the British have some sort of turbo boost, or unknown technology? Actually, the flames were simply a discharge of excess fuel pulled from the carburetor by the negative gravity. Still, it worried the Axis observers.

And so, when the Luftwaffe's turn came, the Germans pushed their planes to prove their superiority. One pilot pushed too hard. He tried to copy the almost vertical climb of the Hurricane, but went beyond the limits of his plane, stalled, spun, and crashed. The pilot died, and though it never fired a shot, and was only temporarily (and illegally) wearing the RAF colors, the prototype Hurricane was responsible for the first victory among many that would follow.

At the beginning of the Battle of Britain, the Hawker Hurricane represented the greatest hope of survival that the British had. It had been a race, and Sydney Camm had won it.

Supermarine Spitfire



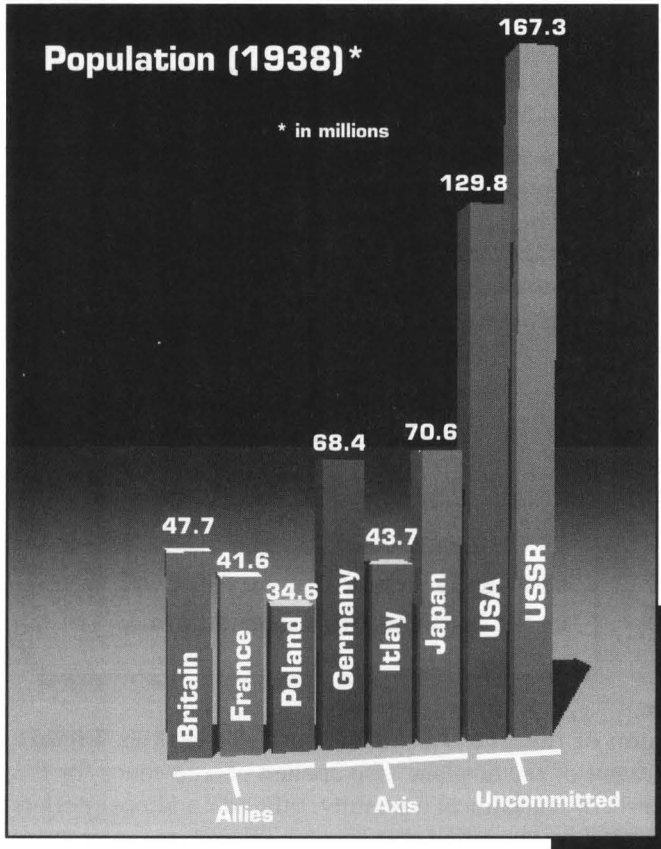
The Spitfire I.

Like the Hurricane, the Spitfire was essentially the product of the drive and imagination of one man. Reginald J. Mitchell had already helped Supermarine to win speed records with their seaplanes. Now he was engaged in two races. The first race was the same one that occupied Sydney Camm—the race with the Germans and the inevitable defense of England. RJ Mitchell's other race was more personal. Mitchell had tuberculosis and had undergone a lung operation in 1933. Recovering from the operation in Germany, he had seen first-hand what the Germans were up to. He knew that England must have a front-line fighter to counter the German planes, and he ignored his health to complete the project. The first prototype flew in 1936, but though he won the first race, Mitchell lost the second. In July, 1937, he died—before he ever saw a production Spitfire completed. But he knew, even then, that his fighter would be the equal or the superior of anything it would face for several years to come.

The first Spitfires were delivered to the RAF in 1938 and saw action as early as1939. Over the course of the war, more than twenty versions of the Spitfire were produced, continually improving the performance and armament of the plane. But the basic design remained, and collectors still love flying the Spitfire.

Like the Hurricane, the Spitfire was powered by the fabled Merlin engine and featured an all-metal stressed skin fuselage, in contrast to the Hurricane which had a fabric skin. Also like the Hurricane, the Spitfire mounted eight Browning machine guns in the wings, but it was not as stable a 'gun platform.' In fact, early models had problems with the wings flexing during firing, but these were corrected. Still later, some Spitfires were mounted with cannons, but they were slower and lost much of their advantage. Continued improvements to the Merlin engine, however, prolonged the life of this plane, and its pilots would only reluctantly change to another plane. Though the Hurricane would prove more durable and easier to repair, the graceful lines of the Spitfire became a symbol of Britain's hopes during the dark days of the Battle of Britain. Moreover, the Spitfire could outrun the Bf 109 and was arguably the most advanced fighter in the air in 1940.

The Spitfire underwent many subtle transformations during the war and continued to see action. Efforts were made to keep it even with the ever-improving FW 190 and the Bf 109. In fact, the model produced in the largest numbers was the Spitfire IX which came in three different models for low, medium, and high altitude flying. 5,665 Spitfire IXs were produced and they featured a four-bladed propeller and a 1,720 horsepower (1,710 in the high altitude model) Merlin engine. The top speed of the Spitfire IX was 404 mph at 21,000 feet as opposed to 374 mph at 13,000 feet in the Mark V. By the end of the war, the Mark XXI featured a new Rolls Royce engine, the Griffon which could produce 2,050 horsepower, propel the plane along at 454 mph at 26,000 mph, and reach a ceiling altitude of 43,500 feet. Only 122 of these were built because the war ended, but one is credited with downing an Me 262, crowning the Spitfire's illustrious career. In all, 20,334 Spitfires were built by the time the model was discontinued in 1947, 2,053 of them with Griffon engines.



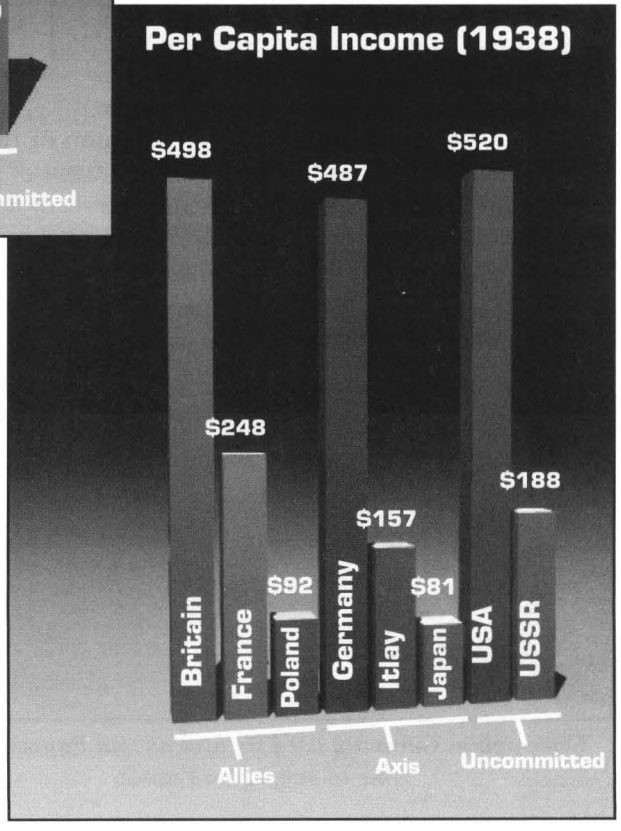
Denmark, Norway, the Netherlands, Belgium, and Luxembourg. Attempts to thwart the German onslaught only resulted in further drains on the slow build-up of British defense forces. In particular, two abortive attempts to save the port of Narvik in Norway resulted in the loss of three precious squadrons of RAF fighters and many of their pilots when the carrier *Glorious* was sunk.

On May 10, 1940, the Germans began their offensive against France, the last of the European nations who could offer any realistic resistance to the Nazi war machine.

trestle table with some packets of cigarettes upon it together with a cardboard notice on which was pencilled 'Business as usual'. That was the spirit which won the Battle of Britain." But that incident occurred after the bombs had begun to fall. It was still 1939, no bombs had fallen, and the British had not yet begun to be tested.

However resolved the British were, they had to sit back and watch as the Wehrmacht continued to overrun

As the world prepared for war, who was better prepared? The charts on the next few pages show relative strengths and population figures for the most significant countries involved in World War II.



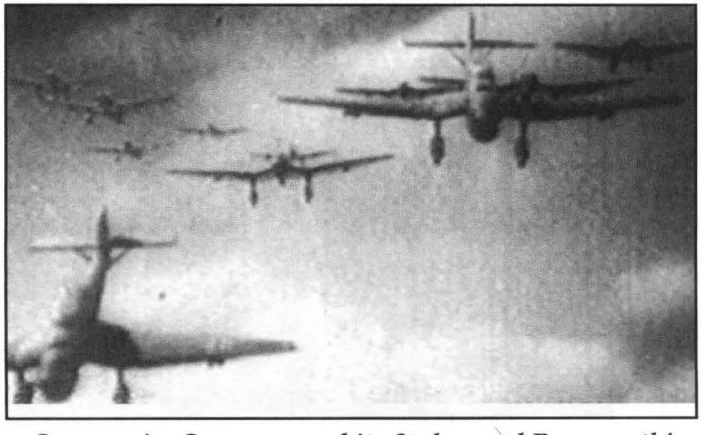
The Defense of France

When Germany invaded France, the British Expeditionary Force (BEF) fought with the French. The leaders of the BEF requested, and received, air support in the form of four squadrons of fighters. At the time, Dowding was fighting a battle to bring the British fighter defenses up to a number that could reasonably counter the expected German bomber invasion and he fought against sending further squadrons to France until a minimum home defense was achieved. However, politics and loyalty threatened to decimate the Fighter Command, which was struggling and pulling every string to get up to its full operational strength before the German menace came with its expected attack.

The Lesson of the Maginot

Human conflict had been lifted suddenly from the surface of the earth into the third dimension...

As if it weren't already obvious, the fall of the famous Maginot Line, a seemingly impregnable system of defense guarding France, was a lesson in the changing character of war. The Maginot Line was unfinished, and its failure was in part due to the fact that the Germans were able to go around it, but they did breach an extension of the line. According to DeSeversky's **Victory Through Air Power**, written in 1942, the advent of the airplane also spelled obsolescence for the fortified line. "The Maginot Line, a true marvel of mechanical ingenuity, offered an almost perfect defense against invasion in its old preaviation forms. The fall of that Line was therefore tantamount to the fall of a whole epoch in the history of warmaking."

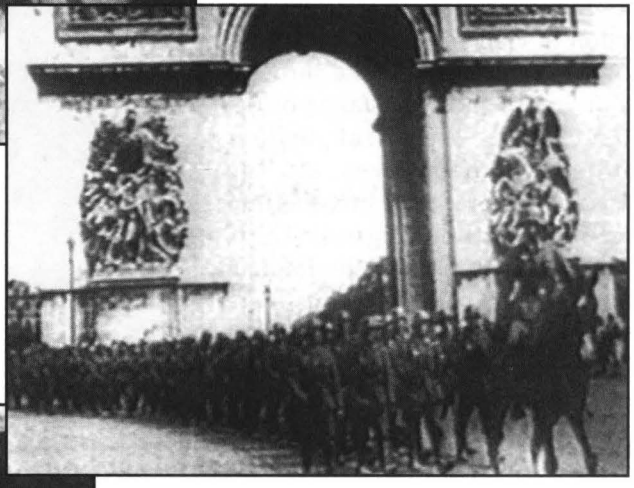


Once again, Germany used its Stukas and Panzers, this time to subjugate France.

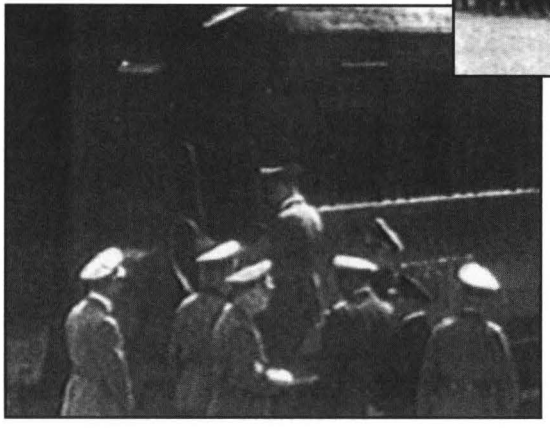
"The Bankruptcy of that form of defense marked the end of two-dimensional warfare. Human conflict had been lifted suddenly from the surface of the earth into the third dimension, nullifying all fixed two-dimensional defenses, whether dykes, fortified walls, or other impediments to surface movements. It nullified also the obstacles represented by oceans and by navies—although that phase of the revolution in strategy is not fully understood. Certainly it has not been grasped by untrained minds, or by minds too well

The Battle of France

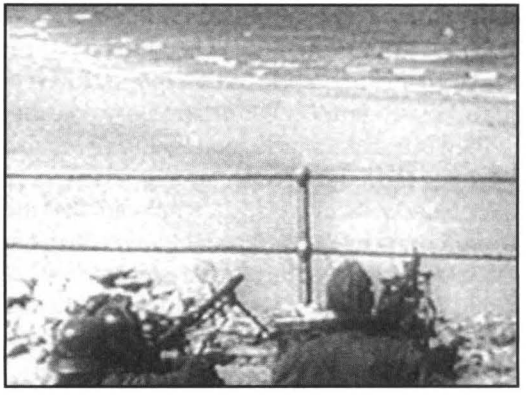
The Nazis invaded France and swept through the countryside on their way to Paris. The French seemed ill-prepared to mount any effective resistance or to launch a meaningful counterattack.



Marching through the Arc de Triomphe, the German Army celebrated their victory as the Petain government sued for peace.



It was a matter of great satisfaction to Hitler that he accepted France's capitulation in the same railroad car where Germany had signed its acceptance of the hated Versailles Treaty.

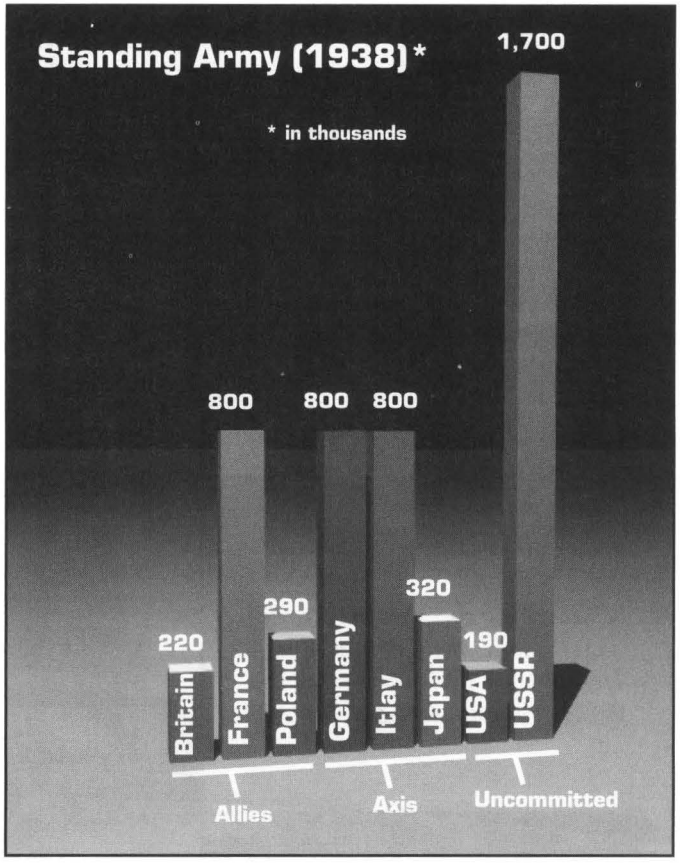


Now the Germans were positioned at the Channel, and England was alone...

schooled in the outlived technical notions of an obsolescent era."

It had become clear that the outcome of this war would be decided largely by air power. The side which could achieve air superiority would hold the greatest advantage.

Meanwhile, Hitler's forces steadily out-maneuvered the French, whose superior tanks were never able to turn the tide of battle. The Germans attacked where the French were least prepared. Under the direction of General Heinz Guderian, the XIX Panzer Corps broke through the thinly stretched resistance of the French Ninth Army at Sedan, establishing themselves on the Meuse. Elsewhere, they breached an extension of the Maginot Line. Eventually, they reached the English Channel. 380,000 Allied troops were trapped at Dunkirk, and the conquest of France was all but complete.

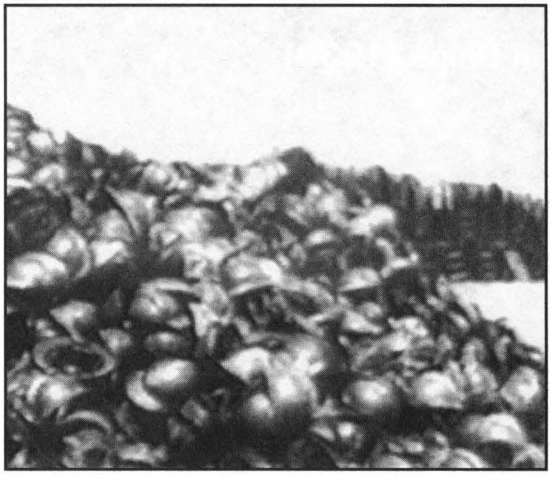


Dunkirk

It's often called the "Miracle at Dunkirk" and it was achieved in part by the incredible mobilization of hundreds of boats—large and small—which braved the Channel crossing to bring back approximately 338,000 British, French, and Belgian troops in a matter of days. As the defense of France collapsed, approximately 85 percent of the BEF were returned safely to England by Operation Dynamo as it was called.

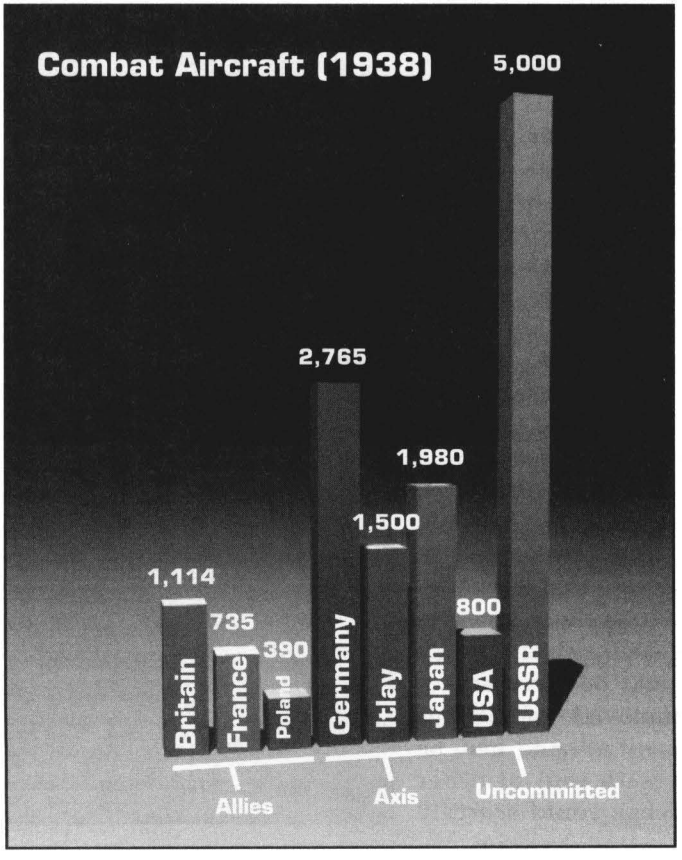
However, this miracle could not have occurred if the RAF had not held the day against the Luftwaffe. For the first time, the German air forces were prevented free reign. For the first time, the RAF was able to challenge the Luftwaffe. As Churchill said after the event, on June 18: "In the fighting over Dunkirk, which was a sort of no-man's land, we undoubtedly gained a local mastery of the air and inflicted on the German air force losses on the scale of three or four to one. Anyone looking at the photographs of the re-embarkation, showing the masses of troops assembled on the beaches, affording an ideal target for hours at a time, must realize that this embarkation would not have been possible unless the enemy had resigned all hope of air superiority at that point." Of course Churchill's view was not shared by everyone, nor was it entirely accurate. As usual, it did bolster the spirits of the people, being close enough to the truth.

Although many pilots gained much needed experience in the Dunkirk campaign, the losses to the RAF were appalling. They flew almost constantly from May 27 to June 4, only gaining some



The British left tons of equipment on the beaches of Dunkirk. Here's a pile of helmets.

Like many cities, Dunkirk was severely damaged by the fighting in and around it.

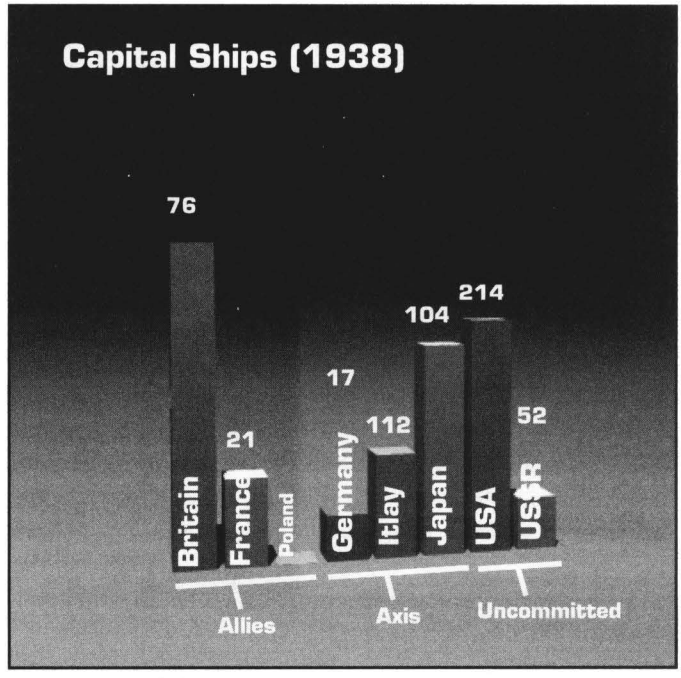


rest on a few days when bad weather prevented the Luftwaffe from flying. In all, the RAF flew 171 reconnaissance missions, 651 bomber missions, and 2739 fighter sorties and lost almost a hundred first-line fighters. However, the Germans had also lost many planes—at least 200 fighters and bombers and 300 aircrew.

Not that all the people involved recognized the RAF successes. The proximity of the Luftwaffe was obvious in the bombs and bullets they delivered. The RAF, often operating high in the clouds, were more remote, and to the evacuees, their effect seemed negligible. In fact anti-aircraft gunners, not well trained in aircraft recognition, often shot at the British planes—they shot at everything in the sky.

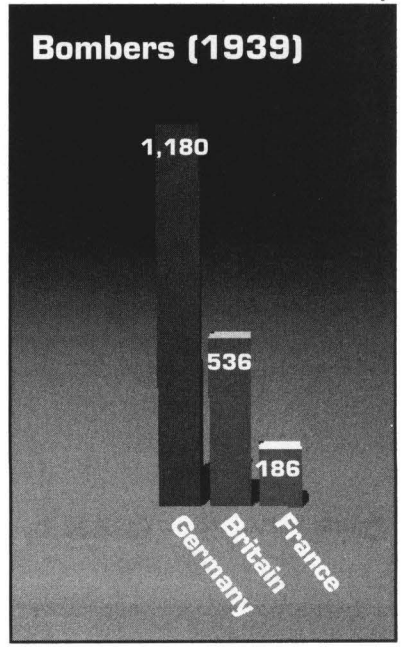
It is suggested by some historians that Hitler stopped the charge of his Panzer divisions in order to spare the English. Seemingly Hitler possessed some fondness and respect for his

English adversaries. Others, like Adolf Galland, more accurately postulate that the reason was more likely because he feared a flank attack by the French, and, even more importantly, because he had relied on Göring's Luftwaffe after Göring had reportedly stated, "My Luftwaffe will complete the encirclement and will close the pocket at the coast from the air." Still others postulate that Hitler wanted to decimate the English and considered defeat from the air to be more brutal and final.



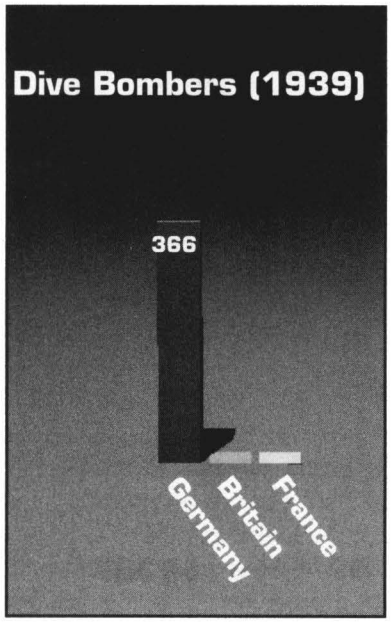
Whatever the case, the evacuation at Dunkirk was a mixed blessing—part victory and part defeat—for both sides. It was, nevertheless, a miracle.

Perhaps equally miraculous from the perspective of the bruised and battered British was the fact that Hitler did not immediately follow the plan drawn up for him by Göring at Milch's insistence. This plan called for the immediate invasion of Britain before they could reorganize their forces. If this plan could have been carried out, it might well have succeeded, but, once again, the British seemed to dodge the bullet and the invasion never came. The truth is, the Germans weren't prepared to cross the Channel and carry out such a plan.



Milch thought this decision was completely mad, but only said so in his diary. He viewed any delay as playing into the hands of the enemy. To him, every hour they waited was sixty minutes the British could use in preparation for their defense.

Perhaps part of Hitler's hesitation can be inferred from his own writing in **Mein Kampf** where he stated: "Britain can be counted upon to show the brutality and tenacity in its government, as well as in the spirit of its broad masses, which enables it to carry through to victory any struggle that it enters upon, no matter how long such a struggle may last, or however great the sacrifice that may be necessary, or whatever the means that have to be employed; and all this even though the actual military equipment at hand may be utterly inadequate when compared with that of other nations." At any rate, Hitler's confidence could scarcely

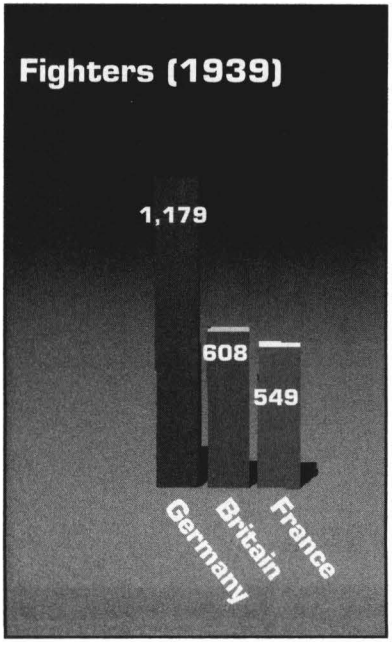


"The British have lost the war, but they don't know it; one must give them time, and they will come round."

have been much higher after Dunkirk and especially after the fall of France.

Within weeks after Dunkirk, France had fallen and Hitler stated to General Alfred Jodl, "The British have lost the war, but they don't know it; one must give them time, and they will come round." Hitler's confidence was not entirely unreasonable. The British defense was on the ropes. Many more RAF squadrons had been lost as the British sent, with increasing reluctance, more and more air support to France.

Eventually, largely at the insistence of Dowding and Air Chief Marshal Sir Cyril Newall, the flow of fighters to France had stopped, but not before the French defense had exacted a monstrous toll on the Fighter Command. Where the Germans had lost about 1300 aircraft, which accounted for a third of their forces used in the French invasion, the RAF had lost more than 950 of theirs. Of these, 386 were the essential Hurricanes and Spitfires that would be needed back home in a few short weeks. The RAF had lost nearly half of its first line air forces. Even at the end, the French were demanding that the English send twenty more squadrons of fighters to their defense. If it had not been for 'Stuffy' Dowding's tenacious refusal to compromise the British defense, the situation would almost certainly have been much worse.



However the fall of France was not, as might be expected, a blow to the British morale. In fact, many Brits expressed a relief to be alone and to be free of the responsibility for defending anybody else. Even King George VI wrote his mother, Queen Mary, to say, "Personally, I feel happier now that we have no allies to be polite to and pamper."

Of course, Churchill gave the battle cry of the nation in his famous speech on June 4 after the evacuation of Dunkirk: "We shall defend our island, whatever the cost may be. We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills: we shall never surrender. . . ."

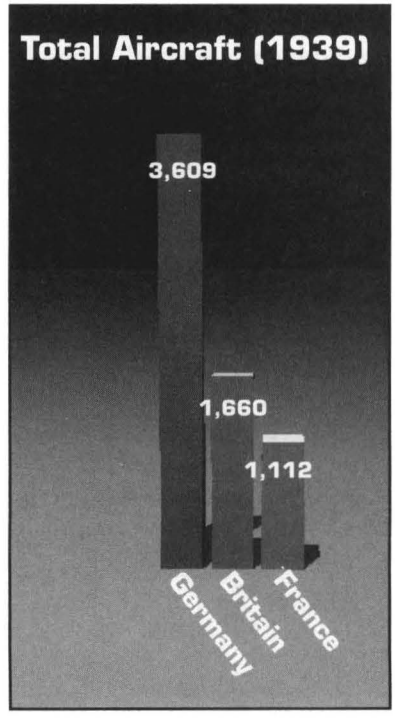
Being the truly inspired leader that he was at the time, despite Hitler's opinion of him that he was a "brandy-swilling boor," Churchill delivered another one his great speeches

"We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills: we shall never surrender..."

upon the formal capitulation of the French government: "What General Weygand called the Battle of France is over. I expect that the Battle of Britain is about to begin. Upon this battle depends the survival of Christian civilization. . . . Let us therefore brace ourselves to our duties, and so bear ourselves that, if the British Empire and the Commonwealth last for a thousand years, men will still say 'This was their finest hour.'"

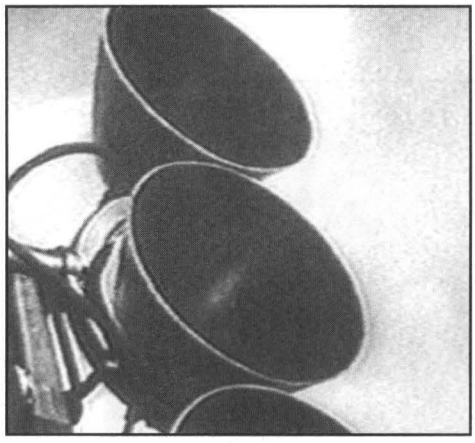
Building a Roof with Eyes—Preparations for Battle

In the few weeks after the Dunkirk evacuation, while France still resisted, the British used every minute just as Milch had imagined they would. The newly appointed Minister of Aircraft Production, newspaper magnate Maxwell Aitken Lord Beaverbrook, had ramped up production of new fighters to a fever pitch, and had taken it upon himself to place the highest priority on fighter production at the expense, for the time being, of bombers. At this stage of the conflict, in retrospect, his action was the correct one. What was needed now was a roof—a protection from the bomber raids that were sure to come. "The Beaver" was, in some ways, Dowding's and Fighter Command's best ally. He used his own newspapers to whip up the British patriotism and commitment to their RAF in every way he could and had people working round the clock to produce the vital Hurricanes and Spitfires needed to protect England. As Churchill was later to state, "Men and women toiled at the lathes and machines in the factories till they fell exhausted on the floor and had to be dragged away and ordered home, while their places were occupied by newcomers ahead of time."



In fact, thanks to Beaverbrook's dedication and the tireless efforts of workers in factories all over the British Isles, the RAF had more planes at the end of the Battle of Britain than they had at the beginning. For the next few months they consistently exceeded production quotas, and, according to one source, in July and August of 1940 produced 972 fighters against a planned target of only 611. The same could not be said for trained and experienced pilots, however. There was no factory which could turn them out as fast as they were being lost by the "end" of the Battle of Britain.

While the aircraft production geared up for a massive effort, the other defenses were reaching final stages of preparedness. The RDF system was finally working and the final "bugs" were being worked out of the communication system that would guide the fighters to their interception points.



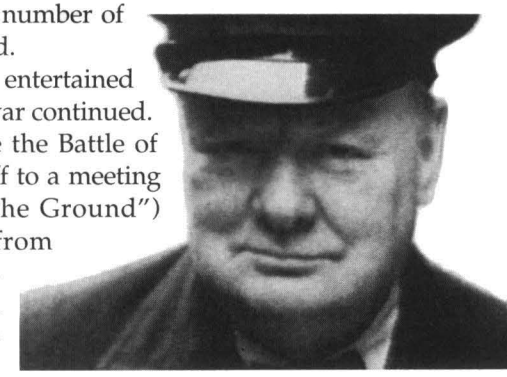
With the RDF net, the Observer Corps were the eyes AND ears of the nation.

"And I'll sit there until either the Germans are driven back or they carry me out dead."

The Observer Corps had stations all over England to watch and report on enemy aircraft that got past the RDF "eyes" and over English soil. Barrage balloons and anti-aircraft guns were in place in key locations. Signposts were removed to prevent the Germans from finding their way (even though the only people to suffer from this indignity were, ultimately, the British themselves). Trenches were dug in fields, then covered over to destroy any enemy aircraft that attempted a landing. Barriers of all kinds were erected to prevent tanks from moving unimpeded across the land, mines were sown in the Channel and ships made ready... In every way possible, the British made a fortress of their homeland.

People patrolled their communities with guns, pitchforks, antiquated World War I machine-guns—in fact anything they could find. One can almost imagine young boys running to the shorelines and hiding, ready to shoot the invading enemy with pop guns or borrowed shotguns (as they did in the United States after Pearl Harbor). The Local Defence Volunteers (later to become the Home Guard) were, at first, without government-issued weapons or uniforms, but they were ready to defend England from any invader by whatever means they had at their disposal. It was a land at the ready, backed into a corner and virtually alone against the most awesome and efficient war machine ever seen.

Less commonly known (in fact it was Top Secret for years) was the fact that the British had obtained the Enigma, the German coding machine, and had cracked many of the highest codes used by the Germans in their radio transmissions. Although many of the most important transmissions were delivered via secure land lines, and other information simply couldn't be decoded and acted upon soon enough to have much effect, the fact is that the breaking of the German codes added to the growing number of weapons the British had prepared for the conflict ahead.



Even if Hitler and certain influential Britons still entertained some notion of making peace, these preparations for war continued. Churchill had no doubts at all. At one point, before the Battle of Britain had begun, he called his Imperial General Staff to a meeting in the underground headquarters (the "Hole in the Ground") beneath Whitehall and stated, "This is the room from which I'll direct the war. And if the invasion takes place, that's where I'll sit—in that chair." He puffed on his cigar and added, "And I'll sit there until either the Germans are driven back or they carry me out dead."

By the beginning of the Battle of Britain, the Germans had conquered almost all of Central Europe and their expanding empire seemed to hover over England from across the narrow Channel.

Chapter 2
Preparations for the Battle

GERMANY'S HESITATION—BRITAIN'S RESOLVE

The many ironies of the Second World War have sometimes baffled, often intrigued historians and others who read about this most tragic and heroic period of human history. The political intrigues that pre-dated the actual German attack on Britain were at once pathetic and fortunate. Hitler's hesitation to attack England after Dunkirk and the fall of France, for whatever reason, was a critical event. Was it his conviction that the British were a "reasonable people" who could not fail to recognize the need to make peace with him on his terms? Or was he so convinced by then of his invincibility that he could not anticipate any real resistance? In fact, Hitler most likely felt that he had already won the war. Certainly he had no failures from which he might have learned caution. At this time, Hitler was anticipating his personal retribution for Germany's defeat and ignominious surrender after World War I.

Had Hitler followed Milch's and Göring's recommendations and launched an attack immediately following the British evacuation of Dunkirk, history might well have been written differently. He couldn't, however. It was logistically impossible. He was forced to allow the wounded British to prepare themselves under Winston Churchill for an inevitable war that they were determined to fight to the end.

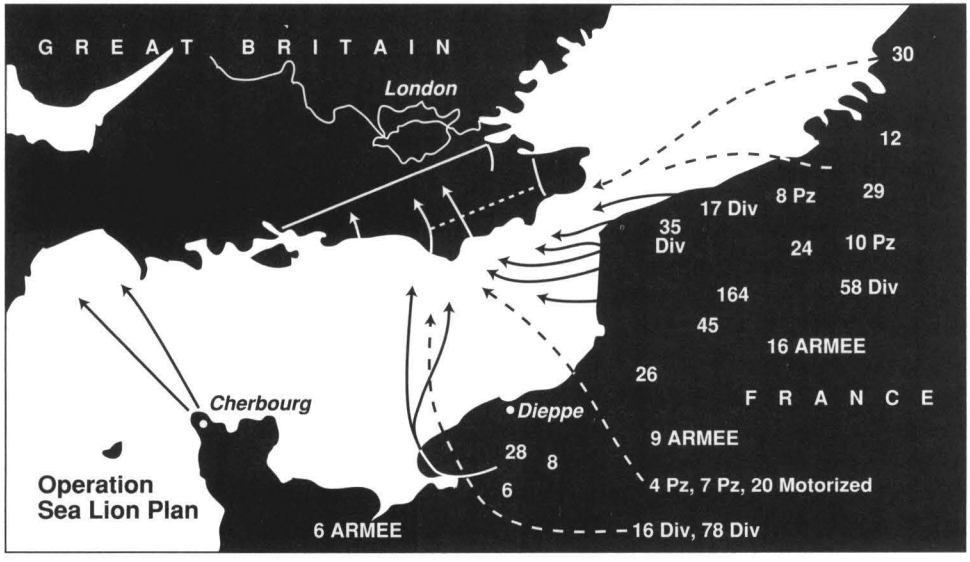
Thus, the scene was set for perhaps the most intriguing and fabled encounter of the war—the Battle of Britain. In this battle for air supremacy, the "Few" battled the onslaught of Nazi bombers and fighters and refused to be defeated. By thwarting Göring's attempt to decimate the RAF, a handful of gallant fighters in Hurricanes and Spitfires saved Britain and may have turned the tide of the entire war.

The story of the battle itself and all the decisions made before and during it shows again and again how tenuous this victory was. In many ways, the British made all the right decisions: from developing the Radar Defense Network with its efficient ground communications system to the installation of the tremendously effective Observer Corps, from the appointment of Air Chief Marshall Sir Hugh 'Stuffy' Dowding as the head of the Fighter Command and Lord Beaverbrook as Minister of Aircraft Production, to the dedication of Sydney Camm and R. J. Mitchell in developing the reliable Hurricanes and the faster Spitfires which would lead the defense against

Germany's Bf 109s and its assortment of bombers and fighter/bombers. Unlike the Germans, the British began fortifying and manufacturing efforts as if there was no tomorrow—as well there might not have been if Hitler had seized the moment.

In contrast, there had never been a complete plan for the invasion of England. Among Hitler's plans, it seems he had always imagined that England would accept his conquests and become his ally, perhaps against the Russians whom he viewed as the real enemy. So it was, as France fell, that the plan to invade England was born, despite Hitler's wishes. If the British insisted on opposing him, then he would have no choice.

OPERATION SEA LION



Hitler had not entirely ignored the need to consider England an enemy, and had, even as early as November of 1939, anticipated using French and Belgian bases from which to blockade the British Isles by air and sea. In May, he had ordered retaliatory strikes in response to the British attacks on the Ruhr, and he had identified the aircraft industry and the ports as the prime targets. Shortly after the fall of France, Hitler had begun preparations for an invasion. On July 2, Chief of the High Command of the Armed Forces (the OKW or Oberkommando der Wehrmacht) Feldmarschall Wilhelm Keitel said, "The Fuehrer has decided that a landing in England is possible providing that air superiority can be attained..." Two weeks later, on July 16, Hitler was to issue his famous Directive 16: "Since England, in spite of her hopeless military situation, shows no signs of being ready to come to a compromise, I have decided to prepare a landing operation against England, and, if necessary, to carry it out."

The landing operation, code named Operation Sea Lion, had one main prerequisite—the total annihilation of the RAF defensive forces. With the RAF out of the way, the Luftwaffe could

provide cover while the German army crossed the Channel and stormed Britain. With the RAF still in existence, however, it was clear that they would enjoy a sort of "home field" advantage for several reasons:

1) The Germans lacked any true long-range four-engine bombers, so their effective attack range was limited.

2) Perhaps even more importantly from the invasion standpoint, German fighters would have an operational life of only 20 minutes over the British skies due to inadequate fuel loads.

3) Downed German planes and pilots were lost to the battle, whereas the British could salvage shot-up planes and make them serviceable again and their pilots who parachuted to safety could return to battle almost immediately.

4) In contrast to the Luftwaffe's lack of range, the British fighters could fight for the entire duration of the flight. They did not have to worry about getting back across the Channel safely.

> I should not care to say which one of the three following strategic aims was responsible for the order to gain air supremacy: the total blockade of the island, the invasion, or the defeat of England according to Douhet concepts. I rather doubt if the General Staff knew themselves, because during the course of the Battle of Britain the stress was put on all of them in turn.
>
> Such an operation is rarely successful and it was quite alien to the usual German methods. The only answer I can find is that taken all in all the High Command at the period had no clear plans for the further pursuit of the war. Hitler's aim as before still lay in the east. The war against England was for him merely a necessary evil, with which he had to cope somehow—just how, he was not quite sure.
>
> **—Adolf Galland, *The First and the Last***

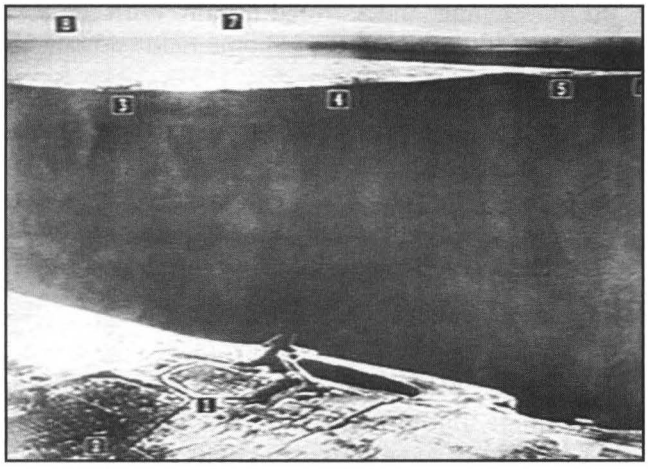
The lack of long-range support was one of the critical problems facing the Germans, but it was a supremely confident Göring who predicted that he would knock the RAF out of the skies in a few days. To him, it would be a simple matter to sweep away the RAF and leave England wide open to invasion.

The German Forces

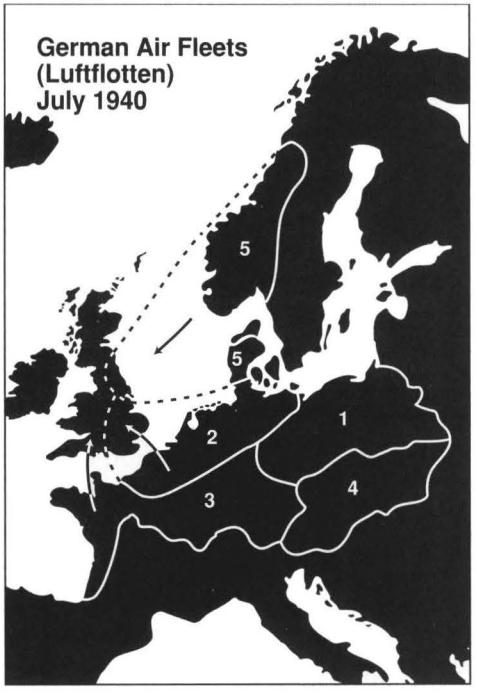
As the battle began, the Germans had three main Luftflotten (air fleets). These fleets were spread out from Norway to France, and were led by tough, experienced airmen.

The southernmost fleet was Luftflotte 3, led by Feldmarschall Hugo Sperrle who had flown in World War I, had headed operations in the Legion Kondor in Spain, and had led Luftflotte 3 in the French campaign. Sperrle was a thick, be-monocled caricature of the Prussian Nazi. His appearance, though in some ways ludicrous and brutal, was in contrast to his abilities as a soldier. His Luftflotte would attack England from the south and southeast.

Luftflotte 2 was headed by Feldmarschall Albert Kesselring who had already led successful operations in Poland and France. Based in France, Luftflotte 2 was poised directly across the

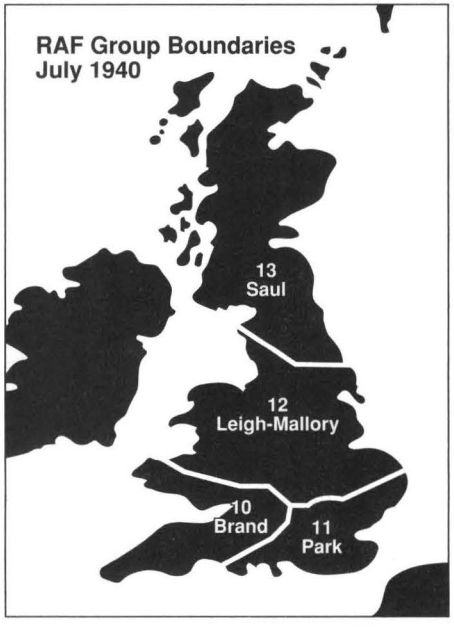


The view across the Channel showing the areas of the British coastline.



Channel from England, and could attack from the narrowest point.

To the north, in Norway and Denmark, General Hans-Juergen Stumpff commanded Luftflotte 5. Although its range was limited, this Luftflotte posed a constant threat to shipping in the North Sea, to the northern British naval bases, and to the northeast coast of Britain and Scotland, neither of which was very heavily defended.

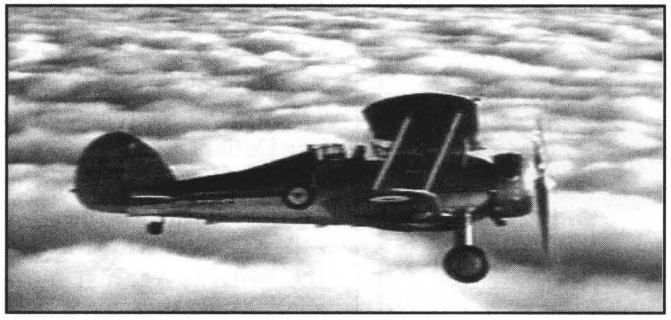


The British

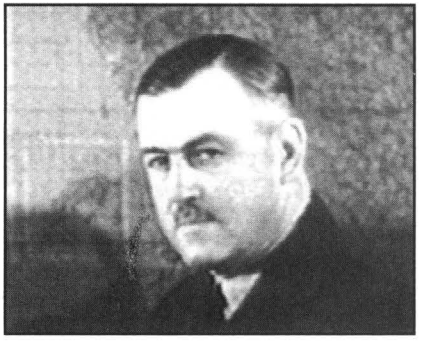
Fighter Command was directed by Air Marshal Dowding from Stanmore, but it was divided into local Fighter Groups. At the time of the Battle of Britain, there were four such Groups.

The Group which would bear the brunt of the German attacks was Group 11, headed by the very capable New Zealander, Air Vice Marshal Keith Rodney Park. Park had experience in combat and also at the headquarters level. He was Dowding's former Senior Air Staff Officer. Park commanded twenty-two squadrons—thirteen Hurricane, six Spitfire, and three Blenheim. The sectors within the Group were situated in a protective ring around London. This was to be the most active area of the coming battle.

South of 11 Group was 10 Group, commanded by Air Vice Marshal Sir Quintin Brand, an experienced



The Gloster Gladiator was likewise an obsolete aircraft that formed a part of the British air defense.

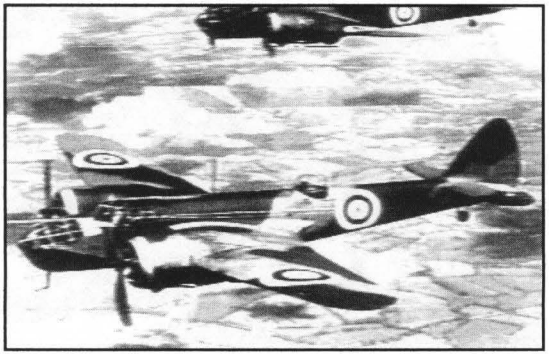


Leigh-Mallory was in conflict with Park and Dowding over the use of the "Big Wing" theory of fighter deployment during the Battle of Britain. He commanded 12 Group, which was responsible for protecting central England, including London.

World War I pilot. His Group was situated to counter attacks from Luftflotte 3 and would guard the southern and south-eastern areas. 10 Group had four squadrons—about 60 Hurricanes and Spitfires as the battle was joined.

Behind 10 and 11 Groups was 12 Group, headed by Air Vice Marshal Trafford Leigh-Mallory. Mallory was a proponent of the "Big Wing" theory in which huge formations of fighters would intercept the German attackers en masse. His views were in contrast to those of Park and Dowding, however, and considerable tension existed between them. This tension grew as the war continued. It may be fair to say that Leigh-Mallory also felt that he should have had the more critical position as leader of 11 Group. At any rate, he was popular with his pilots and listened to what they had to say. 12 Group had about 210 fighters in thirteen squadrons—six Hurricane, five Spitfire, one Blenheim, and one Defiant.

To the north was 13 Group, headed by Air Vice Marshal Richard Saul, an avid sportsman and former Senior Air Staff Officer under Dowding before Park. He commanded about

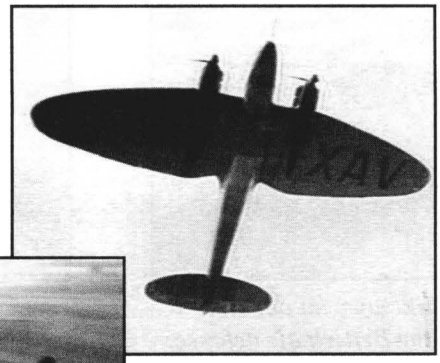


The Bristol Blenheim was an older model bomber that would not be able to affect the outcome of the coming battle.

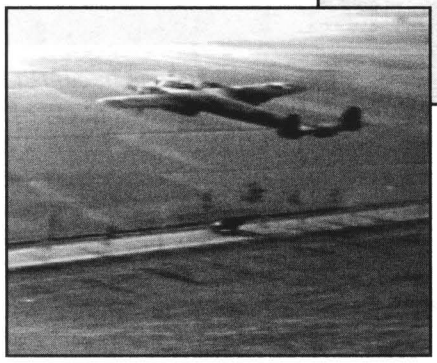
Strength as of July 10

Luftflotten 2 and 3 controlled about 150 reconnaissance planes; 1,131 long-range bombers including Ju 88s, He 111s, and Do 17s; 316 Ju 87 Stukas; 809 Bf 109s; and 246 Bf 110s. Luftflotte 5 had 50 reconnaissance planes; 130 He 111s and Ju 88s; 35 Bf 110s; and some Bf 109s for local defense.

The British had about 700 *operational* Hurricanes and Spitfires and about 100 Blenheims which quickly became converted to night operations due to their inferiority to the German fighters.



He 111 (right) and the Do 17 (below) were two-engine bombers at



Hitler's disposal when the Battle of Britain began. Neither had the range to fly much past London.

220 fighters divided into 14 squadrons; of these there were six Hurricane, six Spitfire, one Blenheim, and one Defiant.

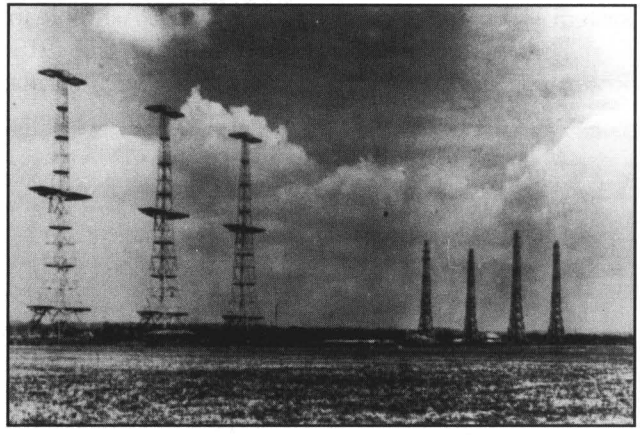
If you counted the numbers, they didn't look all that encouraging for the British. Against more than 1500 bombers and nearly 1100 fighters, the British had to rely on about 700 Spitfires and Hurricanes. Other aircraft were not to figure very heavily in the Battle of Britain, even though the RAF did have about 1200 aircraft con-nected with the Bomber and Coastal Commands, but these were not going to help significantly in the defense of the island. It was up to the fighters of Fighter Command to hold against the superior odds of the Germans. However, for reasons already stated, the RAF did enjoy some advantages, and, practically speaking, the only aircraft capable of meeting the British fighters on anything like an equal basis were the Me 109s. The Me 110s proved extremely vulnerable to the British. Therefore, the odds proved a bit more even when all was taken into account.

The Germans did enjoy a superiority of tactics and experience at the beginning, however. Their pilots were combat-trained, and their tactics were proven in battle conditions. Although the Germans were to have some unpleasant surprises—the vulnerability and inef-fectiveness of the Stukas and the Me 110s, for instance—they did enjoy considerable superiority at the beginning of the battle, both numerically and by virtue of experience. They also had the

Hitler with Göring and Admiral Raeder.

advantage of being on the offensive. They could decide where and when they would attack. In the past, this had been a very definite advantage. In the battle to come, its effect was not as devastating as it might have been. What tipped the scales toward the British, in addition to the "home field advantages" already mentioned, was the communications network on the ground. Not just the RDF system itself, but the efficient and courageous crew of people in the Ops Rooms, spelled the difference in the upcoming conflict.

THE RDF SYSTEM



The RDF towers lined the British coast, silently watching for incoming enemy aircraft.

The story behind the development of radar is well known. Though they were looking at first for a "death ray," the British came up with an efficient defensive weapon—radar. The dedicated team of scientists was headed by Robert Watson-Watt who was then the head of the Radio Research department in the National Physical Laboratory. Watson-Watt had been called in to help the team consisting of H. E. Wimperis, Director of Scientific Research under Dowding, his assistant, A. P. Rowe, and several unpaid experts: Henry Tizard, himself an ex-World War I pilot, and currently the Rector of the Imperial College of Science and Technology and Chairman of the Aeronautical Research Committee; Professor A. V. Hill of University College in London; and Professor P. M. S. Blackett, the discoverer of the positive electron. The remarkable story that followed led to the development of a working radar system, misleadingly called Radio Direction Finding (RDF). The name was intentionally misleading since, at least at first, it could not determine direction accurately, only distance. However, by triangulation, the RDF system was able to be pretty accurate by the time the Germans finally came. When the RDF was first named, however, it wasn't certain that direction finding would ever be possible.

The men working on the development of the RDF system knew they were working against a deadline. They didn't have years to perfect the process. They had to make it work quickly. Reportedly, their motto was "second best tomorrow."

Within nine months of the original meeting on January 28, 1935, the Tizard Committee was able to demonstrate an effective enough system to prompt Air Council to recommend the plan. Though the building went slowly at first, the Chain Home stations, and later the Chain Home Low stations were built in time to perform their duty in saving the British Empire from destruction at the hands of the Nazi aggressors. A later addition was the development of the IFF (Identification Friend or Foe) system by which the radar operators could distinguish the RAF planes from those of the Luftwaffe.

Second best tomorrow...

But the development of radar was only part of the story. It was the amazingly efficient communications network on the ground that guided the forces in the air, and that efficiency was not created overnight. In fact, the structure for that network had been started in the First World War. Though they lacked the key element—radar— the British had, by 1918, set up an extremely efficient system of observers, plotters, telephones and radio communications with the fighters. In fact, most of the basic features of the 1940 radar communications network were present in this earlier system as described by Major-General E. B. Ashmore in 1918 (see sidebar).

The 1940 RDF system was similar to the 1918 version, with the Fighter Command Filter Room at Bentley Priory receiving all the information from the RDF stations and from the

The Prototype Control System (c. 1918)

"A deep zone of country surrounding London, and extending to the sea on the south-east and east, was already covered with defence units under my command—gun-stations, searchlights, aerodromes, balloon aprons, emergency landing grounds, coastal and inland watching posts. Each of them was now treated as an observation station and was connected up by telephone to a sub-control. The sub-controls (there were twenty-five of them) were in their turn connected to the central control in the Horse Guards. This central control consisted essentially of a large squared map fixed on a table, around which sat ten operators (plotters) provided with headphones; each being connected to two or three of the sub-controls. During operations, all the lines were kept through direct: there was no ringing up throughout the system.

"When aircraft flew over the country, their position was reported every half-minute or so to the sub-control, where the course was plotted with counters on a large-scale map. These positions were immediately read off by a 'teller' in the sub-control to the plotter in the central control, where the course was again marked out with counters. An ingenious system of coloured counters, removed at intervals, prevented the map from becoming congested during a prolonged raid.

"I sat overlooking the map from the raised gallery; in effect, I could follow the course of all aircraft flying over the country, as the counters crept across the map. The system worked very rapidly. From the time when an observer at one of the stations in the country saw a machine over him, to the time when the counter representing it appeared on my map, was not, as a rule, more than half a minute.

"In front of me a row of switches enabled me to cut into the plotter's line, and talk to any of my subordinate commanders at the sub-controls.

"The central control, in addition to receiving information from the commander, say, of an anti-aircraft brigade would know, from moment to moment, where and when hostile aircraft would approach his guns.

"By my side, in the gallery, sat the air force commander. . . with direct command lines to his squadrons, and a special line to a long-range wireless transmitter at Biggin Hill. This transmitter was used for giving orders to leaders of defending formations in the air during day time, in accordance with the movements of the enemy as shown on the control map." (E. B. Ashmore; **Air Defence**)

Contrast this 1918 system with the 1940 version, and you'll see that in many essentials it was just like the RDF control system. No wonder the British were able to institute such a smooth-running system to go along with the brand-new innovation of radar.

Observer Corps and passing it on to the various Group and Sector command headquarters. At each of these locations, maps and markers like those used in 1918 indicated the various squadrons of friendly and enemy aircraft. The markers themselves were color coded to five minute intervals on the clock. In that way observers could tell instantly how old a plot was. In each headquarters senior officers were watching the plots constantly and analyzing the situation to determine where and when to send the squadrons of Hurricanes and Spitfires. Almost certainly the Germans, who knew about radar, but not about the communication system that supported it, could not have anticipated the efficiency and speed with which the fighter squadrons were scrambled. Because there always seemed to be British fighters wherever the bomber squadrons appeared, it must have seemed to the Germans that the RAF had much more strength than their intelligence had suggested.

According to some sources, the RAF was so depleted at times that it was only the RDF system that allowed them to keep the semblance of resistance. They simply lacked the fighters, and especially the pilots, at times to keep patrols. Without a system to direct the few remaining planes to their targets, the English skies would have been wide open to attack.

Observations of the RDF Control Centers

Across the map table in the cavernous underground operations room of 11 Group at Uxbridge, three quiet, handsome girls of the Women's Auxiliary Air Force were moving small wooden disks representing reports of minor enemy raids developing.

The controller, sitting in the gallery above, looked down upon this scene as though he were perched at fifty thousand feet in the cloudless, sunny skies of that fatal day for the German Eagles. The picture was clear to him. These were no more than nuisance raids, feints intended to draw his precious squadrons into the air before the main raid developed.

His dire responsibility was to see that his Hurricanes encountered the massed enemy fully fueled and armed. For the useful life of a Hurricane in the air was no longer than the capacity of her fuel tanks and ammunition belt. The one mistake the British could not afford was to have the Germans met by aircraft with ammo expended and petrol running low. At the same time they must not be caught on the ground refueling and rearming when the bombers came over.

If the defense was like a chess game, where moves have to be thought out five and six in advance, it was also like fencing. For every attack there must be a lightninglike and stunning parry and riposte.

— Paul Gallico, **The Hurricane Story**

"Opposite to us, covering the entire wall, where the theatre curtain would be, was a gigantic blackboard divided into six columns with electric bulbs, for the six fighter stations, each of their squadrons having a sub-column of its own, and also divided by lateral lines. Thus the lowest row of bulbs showed as they were lighted by the squadrons which were 'Standing By' at two minutes' notice, the next row those at 'Readiness', five minutes, then those which had taken off, the next row those which had reported having seen the enemy, the next—with red lights—those which were in action, and the top row those which were returning home."

—Winston Churchill, **Their Finest Hour**

Chapter 3

Kanalkampf—The Opening Sorties

The first phase of the Battle of Britain took place mostly over the Channel as the Luftwaffe attacked British shipping, both to disrupt the vital supply lines to the English ports and to lure the RAF out of safety and quickly destroy their planes. According to Adolf Galland in **The First and the Last**, the Luftwaffe had five main goals:

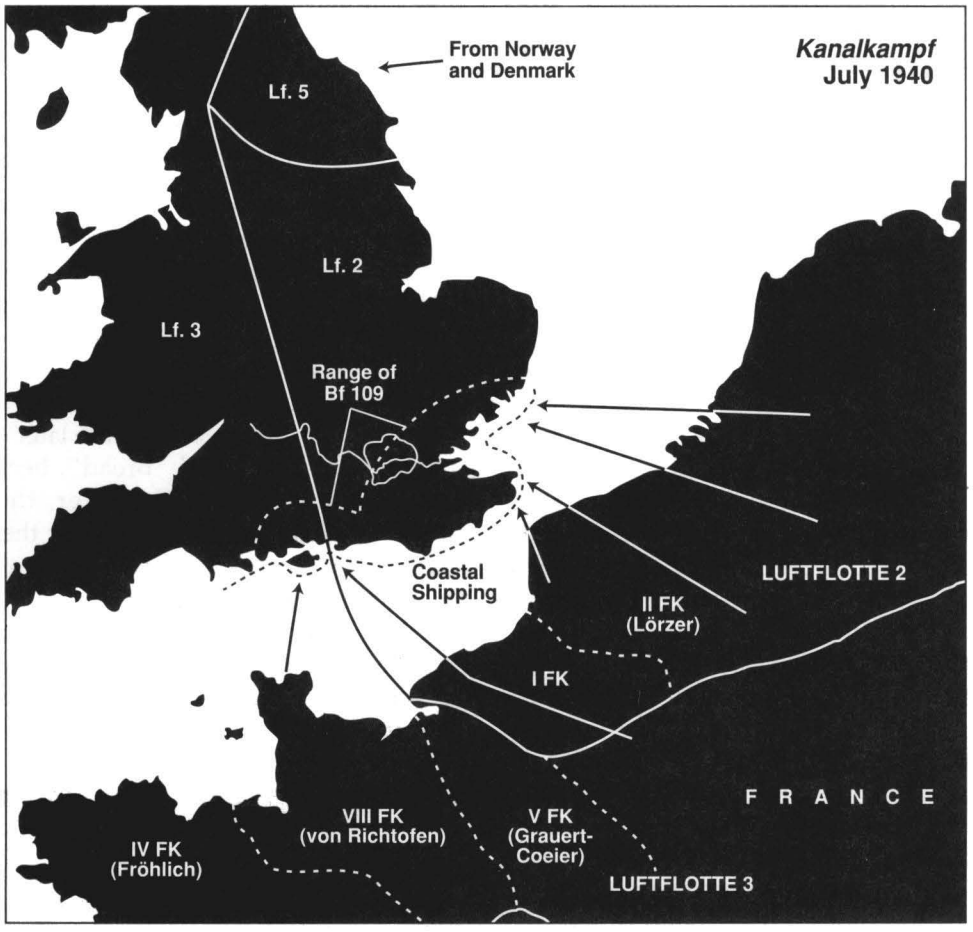
> "1. An unlimited struggle for air supremacy, independent of any army operations.
> 2. Strategic air warfare by means of daylight bombing with fighter escort.
> 3. Strategicl air warfare by means of night raids.
> 4. The sending of fighter-bombers into action.
> 5. Strategic air warfare against supply ships."

At another point in the same book, he spells out the Luftwaffe's aims even more specifically:

> "1. The blockade of the British Isles in cooperation with the navy. Attacks on ports and shipping; mining of sea lanes and harbor entrances.
> 2. The achievement of air supremacy as a preliminary to the invasion (Operation Sea Lion).
> 3. Annihilation of England by total air warfare."

To the British, the Battle of Britain had already begun by the time Hitler delivered the famous Directive 16. It officially dated back six days to the engagement that came to be known as Hellfire Corner which occurred over the Channel on July 10. There had been other engagements, of course, in the previous months. So it may be considered an arbitrary decision to date the Battle of Britain from July 10.

Note: *In the following chronological account of the Battle of Britain, the reported losses are as reported by* ***The Defence of the United Kingdom*** *(HMSO, London, 1957). These figures may be disputable in some cases, but are close to being accurate and were compiled from Fighter Command and Luftwaffe records. These can be considered the 'official' figures.*

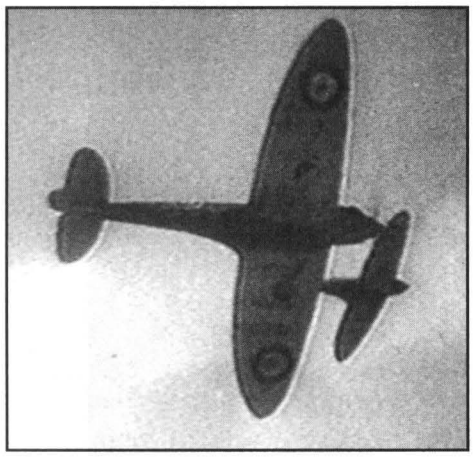


July 10, 1940

Weather: Intermittently Cloudy
Official Losses: Luftwaffe—13; RAF—6

The morning of July 10 featured intermittent rain and did not appear to be a day that would see much action. However, both Kesselring and Sperrle were waiting anxiously for weather reports that would favor the day's planned operations. As usual, high-flying Do 17s and Ju 88s were sent over England to report on conditions. Meanwhile, a group of Blenheims were being briefed on a daylight bombing mission over Luftwaffe air bases near Amiens and St. Omer. The weather conditions seemed to favor scrubbing the mission, but it was sent, and only one of the seven Blenheims returned.

Meanwhile, at 8:15 A.M. Pilot Officer Charles Cooke of No. 66 Squadron sighted a Do 17 reconnaissance plane after coming up through the clouds. He led his section of three Spitfires after the bomber and they were able to shoot it down with a head-on attack. Cooke returned to base with a damaged windshield. His Merlin engine had also taken shots from the 7.9 mm gun in



Spitfires on the hunt.

the Dornier, but had not failed him. By 9 A.M. he and his squadron were safely back at their base at Coltishall.

A little later that morning, as the weather cleared, Spitfires from No. 74 Squadron at Manston were sent to intercept another Do 17. They sped to the attack, but were themselves attacked by a *staffel* of Me 109s escorting the Dornier. Despite taking hits from the Messerschmitts, the Spitfires were able to damage the Do 17 sufficiently to kill its pilot and cause it to crash-land in France. However, this *recce* plane had done its job. Before being attacked, it had spotted a large British convoy in the Channel and had radioed its position back to base. This was to prove critical to later events.

This convoy, code-named "Bread", became the focus of the German attack. However, there was another preliminary act before the actual attack on the convoy. In order to lure out the Fighter Command, make them use their fuel and perhaps suffer more losses, Kesselring sent out a *staffel* of 109s "trailing its coat" (revealing their position by making vapor trails) out over the Channel. They were met by nine Spitfires from Biggin Hill, but the Spitfires were unable to damage the 109s. Only one Spitfire was seriously damaged, but made an emergency landing at Hawkinge.

At 1:30 P.M. the Dover RDF station reported a very heavy build-up of enemy planes near Cap Gris Nez. To counter this threat, five squadrons from No. 11 Group were scrambled. The action was about to heat up.

The first on the scene were 32 Squadron's Hurricanes. They reported 24 Do 17s with an escort of about 20 Me 110s (ahead and behind) and an equal number of Me 109s providing top cover at about 12,000 feet. With only six Hurricanes (against nearly 70 enemy aircraft), they dove into the attacking force. They did not succeed in downing any of the aircraft, but they forced them to begin defensive maneuvers, thereby disrupting the attack on the convoy. It was No. 74 Squadron's Spitfires, led by Johnny Mungo-Park, who scored first, damaging one Dornier while his number two damaged a 109.

Scramble!

While the radar-assisted guns at Dover filled the air with flak bursts and tracer, John Thompson's 111 Squadron (based at Croydon) flew their Hurricanes in a practiced and daring maneuver straight at the bomber formation. Nine abreast, they slashed straight at the

Dorniers, causing the German pilots to break formation. Quickly two Do 17s were shot down, though one pilot, Tom Higgs, cut his attack so close that he collided with his victim, losing a wing in the process. He was never found.

The Me 110s formed a defensive circle (not unlike a wagon train of the Old West when attacked by Indians), but that too was broken up. Eventually, the attacking force retreated in a disorganized rout. The only RAF casualty was Tom Higgs, though two other Hurricanes were ditched.

Countering this success, though, was an attack to the North by Sperrle's Luftflotte 3. His 60 Ju 88s were able to bomb their targets and return to base without being intercepted at all. The radar operators had not recognized the threat in time to mobilize the squadron from Pembrey. The only pilot to spot these raiders was Ira Jones, a veteran of World War I with forty kills. Flying a trainer aircraft and armed with only a Very pistol, "Grandpa Tiger" Jones had flown within 100 yards of a Ju 88 and fired. Although it did no damage, the German bomber turned and flew away. "I screamed along the top of the cloud, just to have the fun of seeing him run away."

Though the action was not over for the day, weather prevented any other concerted attacks over England. There was also heavy fighting in the Mediterranean that day, with claimed losses of about a dozen Italian planes. In all, the day claimed at least 12 Luftwaffe planes confirmed and at least 10 more damaged. The RAF lost one plane and pilot, while the convoy, "Bread," lost one ship.

HURRICANE MISSION 3

A Channel convoy is under attack by Do 17 bombers protected by Bf 109s. Fight through the fighter screen and stop the bombers.

Historical Engagement

The German strategy in the opening round of the Battle of Britain was to destroy all British shipping in the Channel. On July 10, 1940, several convoys were sailing the Thames estuary and the Dover Straits. A large force of Do 17s from I/KG 2 escorted by Bf 109s from I/JG 3 attacked a convoy codenamed "BREAD" in the Dover Straits. Hurricanes from the 56 Squadron based at Manston intercepted the attack. A massive dogfight ensued and the attack was repulsed with one ship sunk.

Your Mission

Patrol and protect the convoy from the Do 17 bomber attack. You fly a Hurricane as part of the 56 Squadron from Manston. There are several Rotte of Bf 109s flying ahead and clearing the way for the bombers. Fly through the fighter shield and attack the Do 17s before they release their bombs on your convoy.

Initial Starting Positions

You are on patrol at 7000 feet in the middle of the Channel.

The convoy of two ships is behind you, mid-Channel at 7 miles NW.

2 Bf 109s are heading NNW at 5000 feet 12 miles ESE of you.

2 Bf 109s are heading WNW at 5000 feet 13 miles SSE of you.

3 Do 17s are heading NW at 4000 feet 19 miles SE of you.

Strategy

Maintain your altitude and fly through the fighters protecting the oncoming Do 17s. One or two of the fighters may climb to your altitude to intercept you. If they're in gunning range, go ahead and shoot, but don't pursue them. Keep your course to the SE to intercept the bombers. As you approach them, they should be slightly below you. Make a wide turn and dive on them, just as they pass you. This should put you slightly above and behind them. Try to damage as many bombers as you can on the first pass. You won't get too many free runs on them, once the fighter cover catches up with you. If you can damage a bomber sufficiently to make it drop its bombs and head for home, go on to the next bomber. You can always mop up later. After you destroy the bombers, you'll still have to contend with the fighters. If you think you might get destroyed, make sure you bail out over the Channel, and not over enemy territory. If you do, your pilot may be captured.

BF 109 MISSION 1

Engage a group of Hurricanes as they attack your Do 17 bombers. You'll need to stick close to the Dorniers to defend them, particularly before they have dropped their bombs. After the attack, you can pursue the enemy fighters more vigorously.

Cross Reference: Hurricane 3.

Strategy

In this scenario, you must protect the Do 17 bombers who are about to drop their bombs on two ships in the Channel. As lead aircraft, you must engage the Hurricanes at all costs. The first two Hurricanes approaching head on will attempt to fly right by you to attack the Do 17s. Use your more powerful 20 mm cannon to engage these aircraft from a distance. Try to inflict as much damage as possible, but use the ammo from your big gun sparingly. If any of the Hurricanes slip past, execute a 180 degree turn and pursue them. A Hurricane may try to lead you away from the Do 17s. If you find yourself too far away from the bombers, don't pursue. As the other Hurricanes engage your bombers, you'll be too far away to provide adequate coverage. Flying a close formation with the bombers will give you the best advantage in warding off their attacks. With your smaller gun, it may take several good shots to bring down the Hurricanes, whereas the larger gun allows for fewer shots and less accuracy. Using the proper combination of both of these weapons will yield the best results. Once the bombers have dropped their bombs, you can venture further away from them and take a more offensive stance toward the Hurricanes.

JU 87 MISSION 1

In the opening round of the battle, attack a convoy of ships in the Channel. Escorting Bf 109s protect you from attacking Spitfires.

Strategy

As you start this mission, the target ships are slightly south of your current heading. If you look to the left you'll see another Stuka slightly ahead of you. He immediately makes a slight course correction to the south to line up with two ships that are slightly north of the rest of the fleet. Follow his course correction to line up with these ships as well. The other Stuka will bomb the furthest ship so plan on bombing the first one in this group. Use the pan mode (by hitting PgUp) to see how far off you are from being dead center with the target and how many degrees down you are from reaching the optimum dive bombing angle of 70 degrees. Switch back to forward view to make any corrections if necessary. This is a good time to turn on your rear gunner in auto mode because things get real busy from now until the end of the bombing run. Switch back to pan mode, and line up your gun sight slightly beyond the ship. When the display says 65 degrees, switch to forward view, set your dive brakes, and begin your dive. Again, line up your gun sight just beyond the ship as you make your descent. You can make slight course corrections on your way down, but be careful of your dive angle because if you invert the plane you won't be able to release your bombs! At 3000 feet release your bombs. At 2000 feet, pull the nose up, release the dive brakes and increase your throttle to 100% and begin your climb to about 3-4000 feet. Head east to return to your home field.

On your way back, you'll get jumped by several Spitfires. Depending on how good your fighter cover was in this mission, expect to see at least 6 Spitfires during the return trip. You may want to put the plane in auto pilot and man the rear gunner seat to conserve ammo.

JU 87 MISSION 3

Join the second wave of dive bombers attacking a convoy in the Thames Estuary.

Strategy

When you start this mission you and your wing leader are heading for two ships in the Estuary. Two squadrons of Hurricanes are flying about, one squadron is slightly ahead of you to the North. Turn on your auto rear gunner and follow your flight leader to the first ship in the group. By following your flight leader, you can rest assured that your approach and dive are going to be decent, however, the flight leader approaches the target from the side which gives you less of a chance that your bombs will hit. In addition, his approach from the North, puts you in danger of meeting up with the Hurricanes before you drop your bombs. By flying directly at the ship using the pan mode to help you line up

the target, you can approach the ship from the front, giving more opportunity for your bombs to hit along the ship. In addition, the Hurricanes will be busy with your leader while you sink the ship! On the return trip home, set your auto pilot at about 3-4000 feet, and jump in the rear gunner seat to pick off the trailing Hurricanes.

July 11, 1940

Weather: Cloudy
Official Losses: Luftwaffe—20; RAF—4

This day was to see several encounters—some significant, some very small. For instance, in an encounter with a lone Do 17, Flight Lieutenant Peter Townsend was unable to down the bomber despite hitting it 220 times and injuring several crew members while shooting in a rainstorm with his head stuck out the cockpit for visibility. His Hurricane, however, took a lucky shot in the coolant system, and Townsend had to bail out 20 miles from the English coast where he was rescued in the middle of a mine field by a trawler.

In another encounter, the famous Douglas Bader flew alone after a low-flying Dornier. He let loose a couple of bursts beginning at about 250 yards, but lost the plane in the clouds. Frustrated, he returned to base at Coltishall only to find out later that the Dornier had crashed in the Channel.

In other action, a small convoy was attacked by Ju 87 Stukas escorted by about twenty Me 109s. Two of the six attacking Spitfires were shot down, but the German attack was disrupted. Later, over Portland, six Hurricanes attacked a force of 15 Ju 87s and shot down two of them while the escorting force of Me 110s proved too slow to intervene. Later, two 110s were shot down.

Not everyone was happy with the current state of affairs. Dowding was concerned about losses, which over the past few days had mounted to 15 aircraft. On the other hand, not seeing the picture from the command level, some of the pilots were frustrated by the way they were sent in such small sections or flights against overwhelming odds. To the public, however, the David and Goliath image was excellent propaganda, especially since successes tended to be somewhat over-reported and losses were accurate or even under-reported.

July 12, 1940

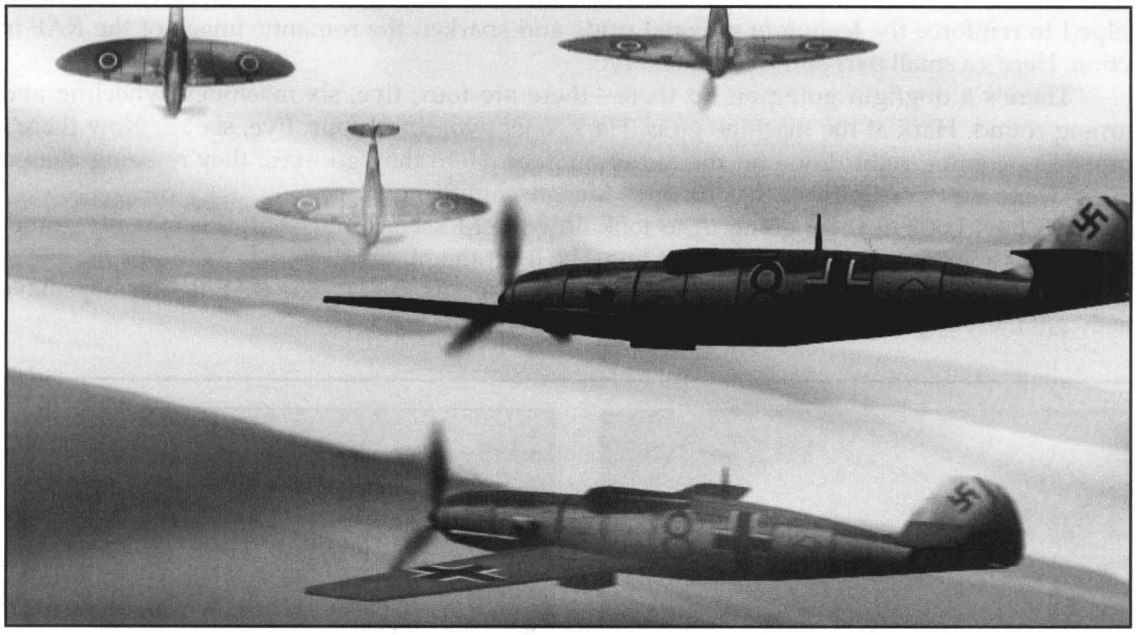
Weather: Foggy, Thunderstorms
Official Losses: Luftwaffe—7; RAF—6

Kesselring sent over forces of Dorniers and Heinkels to attack a convoy off the east coast. Two Hurricanes were shot down, losing both pilots, and planes of 151 Squadron were damaged by accurate crossfire from the bombers.

July 13, 1940

Weather: Foggy, Cloudy
Official Losses: Luftwaffe—7; RAF—1

Some raids were mounted against shipping near Dover and Portland.



Alan Deere's Close Encounter

Douglas Bader recounts several pilots' stories. Here's one from Alan Deere after colliding his Spitfire with a 109. "Black smoke poured into the cockpit and flames appeared from the engine. I reached to open the hood in order to bail out, only to discover that his propeller had struck the front of my windscreen and the whole fixture was so twisted that I could not move the hood. I could not see for smoke, but managed to ascertain that I was headed inland. Nearly blinded and choked, I succeeded in keeping the airspeed at about 100 miles an hour. The engine was now seized and I just waited to hit the ground. Suddenly there was a terrific jerk and I was tossed left, then right, and finally pitched hard forward on my straps, which fortunately held fast. I seemed to plough through all sorts of things and then stop.

The remains of my ammunition were going off in a series of pops and the flames were getting very near the cockpit. I practically broke open the hood and, undoing my harness, ran to a safe distance. My eyebrows were singed. Both my knees were bruised, but otherwise I was uninjured. The Spitfire was blazing furiously in the middle of a cornfield and had left a trail of broken posts and pieces of wing plus the complete tail unit, extending for 200 yards." (from **Fight for the Sky**.)

July 14, 1940

Weather: Light Clouds
Official Losses: Luftwaffe—2; RAF—4

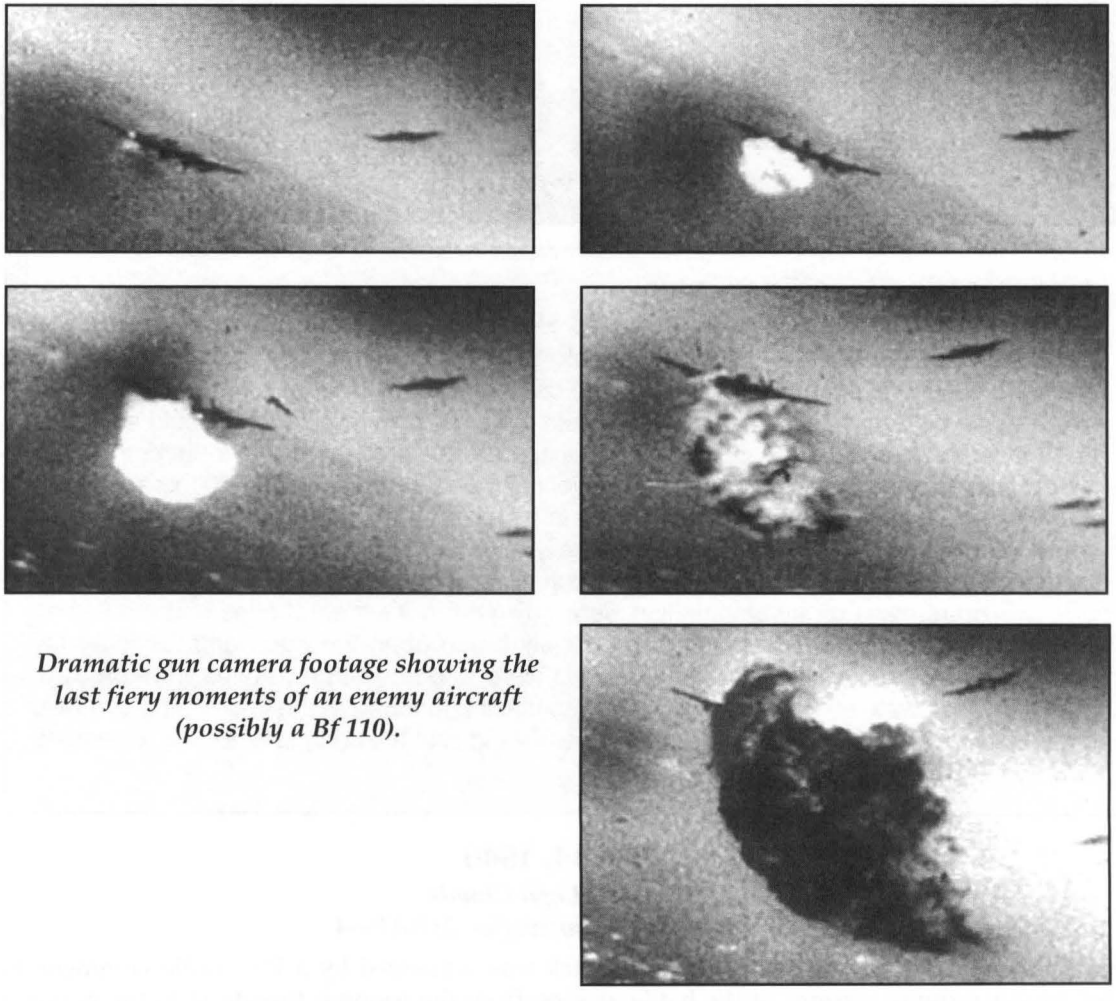
In an historic moment, a German convoy attack was witnessed by a BBC radio commentator who gave a running account of the battle as seen from the ground. Broadcast to the nation, it

helped to reinforce the feeling of national pride and sparked the romantic image of the RAF in action. Here's a small part of the commentary:

"There's a dogfight going on up there—there are four, five, six machines, wheeling and turning round. Hark at the machine guns. Hark, one, two, three, four, five, six . . . Now there's something coming right down on the tail of another. Here they go—yes, they're being chased home. There are three Spitfires chasing three Messerschmitts now . . .

"Oh boy! Look at them going. And look how the Messerschmitts—oh this is really grand! And there's a Spitfire just behind the first two—he'll get them!

"Oh, yes—oh boy! I've never seen anything so good as this . . . the RAF fighter boys have really got these boys taped."



Dramatic gun camera footage showing the last fiery moments of an enemy aircraft (possibly a Bf 110).

On this day, the Air Ministry issued an order stating that non-combatant aircraft found in "areas in which operations are in progress" should be shot down. In particular, this meant the German rescue planes with their big red crosses painted on them. This was an order that caused much controversy, and was later to create some dissention.

July 15, 1940

Weather: Cloudy
Official Losses: Luftwaffe—3; RAF—1

A slow day. Some attacks on shipping.

July 16, 1940

Weather: Foggy and Cloudy
Official Losses: Luftwaffe—3; RAF—2

There wasn't much activity in the air, but Hitler's Directive 16 sets the stage for the future of Operation Sea Lion.

July 17, 1940

Weather: Light Rain
Official Losses: Luftwaffe—2; RAF—1

Minor attacks on shipping near Dundee and Beachy Head. Spitfires of 64 Squadron are attacked from "up sun" by Luftwaffe fighters, losing one Spitfire and never even seeing the attackers. This was a further lesson to the RAF on the ineffectiveness of the VIC formation and the need to adopt the the more adaptable "finger four" of the Germans.

July 18, 1940

Weather: Light Rain
Official Losses: Luftwaffe—4; RAF—3

On this day, the Germans sent over a formation that acted like a bomber formation, but was composed entirely of fighters. They ambushed a squadron of Spitfires, shooting one down. At least one historian has suggested that this might have been a test of the RDF stations and that the Germans might have been figuring out how the radar stations helped the RAF.

July 19, 1940

Weather: Clear, occasional Showers
Official Losses: Luftwaffe—2; RAF—8

This was the day that showed clearly the inferiority of the Boulton Paul Defiant fighter and established that it would be up to the Hurricanes and Spitfires to win or lose the Battle of Britain. The main problems of the Defiant were slow speed and the lack of forward armament. The gun turret was heavy and too slow to move, and the Defiant could only attack from the rear. In a

disastrous attack, six out of eight Defiants of 141 Squadron were lost when they were attacked from the sun by 20 Me 109s. The inferior Defiants, despite a rear gunner, were simply no match for the 109s and were decimated. Five fell to the sea after the first attack. The rest of them were only saved when John Thompson's 111 Hurricane Squadron arrived.

Later, in the evening, Hitler delivered his famous "last appeal to reason" speech which had been termed everything from an out-and-out threat to a "thorny olive branch."

Where this was a distressing day for the British, the German pilots felt greatly encouraged. British shipping had become more infrequent and they counted this a sign of their success. In addition, the small numbers of British fighters they encountered convinced them that the RAF was on its last legs. From the German side, everything looked to be going very well, despite losses of almost two to one.

Excerpt from Hitler's Speech of July 19, 1940

"At this hour I feel it is my duty to appeal, in good faith, for reason and wise counsel on the part of Great Britain, as of all other countries. I consider that my position allows me to make this appeal, since I do not speak as a defeated man begging favors, but as a victor speaking in the name of reason. I really do not see why this war should continue." This was followed by threats and finally, "Mr. Churchill ought for once to believe me when I say that a great empire will be destroyed, an empire which it was never my intention to destroy or harm. It gives me pain when I realize that I am the man who has been picked by destiny to deliver the final blow to the edifice which these miserable men have already shaken."

The British response, though unofficial, was perhaps delivered by a journalist named Sefton Delmer. In German, he broadcast this reply: "Let me tell you what we here in Britain think of this appeal to what you are pleased to call reason and common sense. Herr Fuehrer and Reich Chancellor, we hurl it right back at you—right back into your evil-smelling teeth!"

July 20, 1940

Weather: Intermittent Clouds
Official Losses: Luftwaffe—9; RAF—3

One of the heaviest engagements of this day occurred over a convoy heading east. Some 24 Hurricanes and Spitfires were scrambled to fend off an attack by Ju 87s. In the resulting melee, the Brits surprised the Germans from out of the low sun and were able to down four Me 109s while losing two planes. In all, nine of the Luftwaffe's aircraft failed to return.

July 21, 1940

Weather: Clear, occasional Showers
Official Losses: Luftwaffe—9; RAF—6

Various convoy attacks took place in heavy fighting.

July 22, 1940

Weather: Mostly Clear
Official Losses: Luftwaffe—1; RAF—0

As the British officially reject Hitler's so-called peace offer, the fighting is light with some attacks on shipping.

July 23, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—3; RAF—0

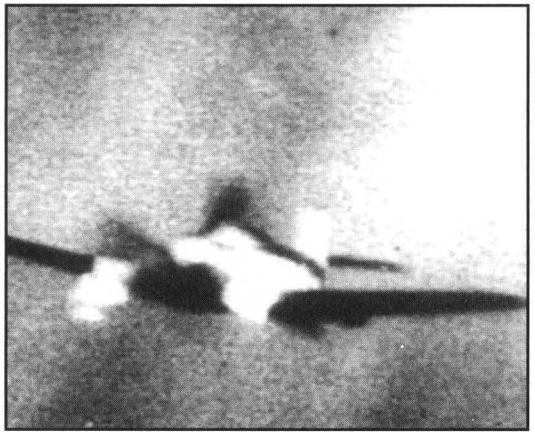
Scattered attacks on shipping.

With the rejection of the peace offer, the battle slowly takes a new character. Although these days see relatively light action and the weather is poor, there is little doubt in the minds of the British that more, and heavier attacks are imminent.

Chapter 4
Prelude to Eagles

July 24, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—8; RAF—3



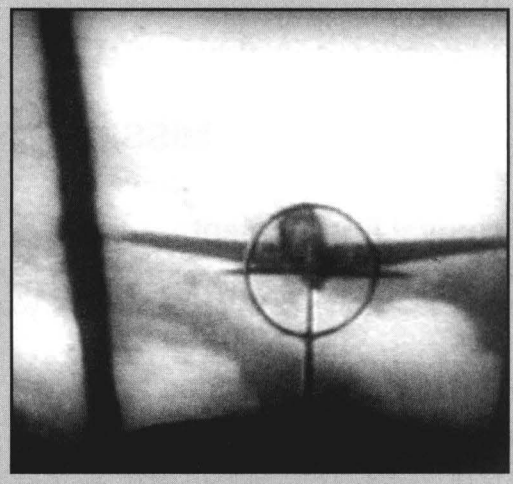
On this day two simultaneous attacks were made on shipping convoys at 8 A.M. The attacks were over the Thames Estuary and off of Dover. The strategy was to force the defending forces to split up, and it worked to the extent that 54 Squadron, which sighted both attacks, was forced to split up. Although no German aircraft were downed in these encounters, their bombs were off-target and the convoys sailed on without losses.

Later, at about 11 A.M., another raid was sent out over the Thames. This was the force in which Galland flew as fighter

According to Galland, July 24 marked the beginning of the second phase of the Battle of Britain. He speaks of his first action over England where his *staffel* encountered a squadron of Spitfires. "Together with the staff flight I selected one formation as our prey. We made a surprise attack from a favorably higher altitude. I glued myself to the tail of the plane flying outside on the left flank. During a right-handed turn I managed to get in a long burst. The Spitfire went down almost vertically. I followed it until the cockpit cover came flying toward me and the pilot bailed out. I followed him down until he crashed into the water. His parachute had failed to open."

Adolf Galland using typical hand gestures to describe an air battle.

Nobody really knew how to fight a war with fighter planes at this time. World War I lessons were helpful, but not in all cases applicable. Experiences gained by the Luftwaffe in Spain as well as the Japanese and Americans in China were to help hone the skills of the first World War II aces. The immense firepower contained in a single Spitfire or Hurricane was awesome by comparison with that carried by planes from the earlier conflict. So, just as the British pilots had to learn the hard way about the ineffectiveness of the VIC formation, they also learned from experience how close they had to be to shoot down enemy planes moving anywhere from 250 to 400 miles per hour.



One of the pioneer outfits of air combat was the Flying Tigers in China. Here a pilot takes aim in a P-40.

By this time, many of the RAF pilots were changing the harmonization of their guns. Guns are harmonized so their shots will converge at a certain range. In the original design, the eight-gun complement of the Hurricanes and Spitfires were harmonized at about 650 yards, but the successful pilots would approach much closer, and, although the official policy wasn't to change for some time yet, many ground crews were re-harmonizing the guns at 250 yards according to the pilots' recommendations.

In addition to the harmonization, British pilots had discovered that different types of ammunition could be loaded into the guns. Some bullets would pierce armor, others would leave a tracer stream, or would flare up on impact. These would be of immeasurable help when trying to determine where your shots were hitting, and could spell the difference between simply damaging an enemy aircraft and shooting it down. With accurate aiming, the pilot could hit the vulnerable parts of a plane and very quickly destroy it.

support. No. 54 Squadron once again flew into the battle against some forty German fighters, eventually downing two Me 109s. Meanwhile No. 65 Squadron from Manston attacked the Dornier bombers, but without success.

Knowing that the Me 109 escort would run out of fuel and have to head back, Park sent 610 Squadron to cut them off. But 610 encountered JG 52 who were flying to protect Galland's III/JG 26. In the ensuing battle, three fighters from JG 52 and three more from JG 26 were shot down while three of 610 Squadron's Spitfires were also destroyed. Galland was able to return unharmed, however.

As an aftermath to the activities of the day, the Spitfire pilots bounced a plane which they identified as a French Chance Vought V.156, but it later turned out that this one had been a Blackburn Skua of 806 Squadron, Fleet Air Arm. It was still a successful encounter from the RAF point of view. Against the odds, they were still inflicting greater casualties on the enemy than

they were sustaining. But for how long could they keep it up? And what would happen when the real German offensive came?

MISSION BF 109 NUMBER 3

Historical Engagement

Play Adolf Galland's wingman and see if you can help the future general of the Luftwaffe cross the Channel to safety. And see if you can get back alive, too.

Initial Aircraft Positions

You and Galland start out at 4,000 feet.

Two Bf 109s are heading North at 1,000 feet. They are 9 miles NNW of your position and their air speed is 243 mph.

Two Spitfires are heading ENE at 4,000 feet. They are 8 miles WNW of your position. Air speed is 249 mph.

Two Spitfires are heading South at 4,000 feet. They are 13 miles NNW of your position. Air speed is 249 mph.

One Spitfire is heading WSW at 5,000 feet. It is 9 miles ENE of your position. Air speed is 249 mph.

Strategy

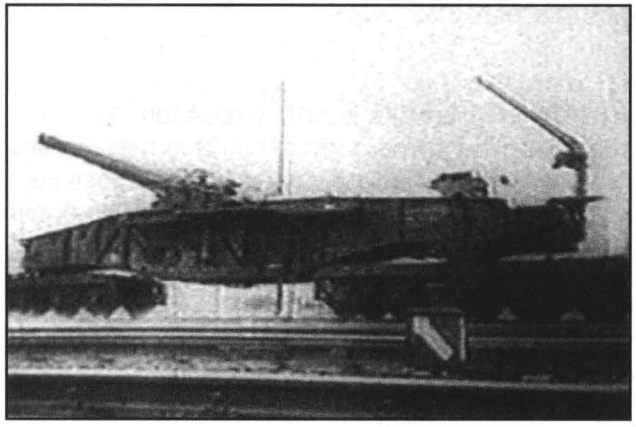
This mission requires that your dogfighting skills be finely honed; all the enemy pilots are all top aces! As you begin the mission two Bf-109s are North of you heading back to France. Two Spitfires are approaching you on your left, from the West. Another Spitfire is approaching from the East. Two more Spitfires are about to attack the Bf-109 group ahead of you. Attack the group of Spitfires on your left first, since they are the closest. After you shoot them down, attack the single Spitfire that was approaching you from the East. Then move North and join the group of Bf-109s who are engaging two Spitfires. Another group of two Spitfires will appear and join in the fight once you get there. When that group has been destroyed follow the Bf-109s back to France. Think you're safe now? No way! When you reach the French coast two more Spitfires will engage you. Hopefully you conserved ammo during the first wave of attacks. You must carry out swift attacks against the Spitfires if you want to survive this mission. The key is to get them quickly, to shoot them down in small groups rather than waiting until you are jumped by 4 or 5 of them.

July 25, 1940

Weather: Clear

Official Losses: Luftwaffe—18; RAF—7

After the past few days of moderate fighting, Kesselring made a determined and clever attack on a merchant convoy near Dover. As a diversion, he sent a large force of Me 109s skimming the Channel to force a response from the defenders. Three RAF squadrons, Nos. 65, 32, and 615, were sent to counter the attack of about 40 109s. In the battle, the defenders used their ammunition and fuel so that, soon after, when a force of Ju 87s and Ju 88s arrived, the convoy was unprotected. Nine Spitfires were sent from No. 54 Squadron, but they were overwhelmed by a large escort of fresh 109s. Later that afternoon, another German bomber formation was broken up by a head-on attack by Spitfires from Squadrons 64 and 111. Still later, another bomber formation harried the convoy. With additional support from German gun emplacements at Cap Gris Nez and still more firepower being added by the German E-boats, this was a doomed convoy. To counter the attack, several 11 Group squadrons flew to the scene. The attack was successful, however, as eight merchant ships were sunk and several others, including two destroyers, were damaged.



German cross-Channel gun.

RAF losses, though numerically fewer than those of the Luftwaffe, were serious. 54 Squadron alone had lost five pilots with three wounded and had flown more than 500 sorties—all in three weeks. In all, the situation was pretty dire. As the US ambassador, Joe Kennedy, came over to see the situation for himself and told the British that the people in the U.S. expected them to be defeated within a month. Such pessimism infuriated the British, however. They fought on.

SPITFIRE MISSION 3

Defend a Channel convoy from Stuka dive bombing attacks. Numerous Bf 109s are supporting the Ju 87s in their mission.

Historical Engagement

On July 25th, a convoy was headed west through the Dover Straits. Albert Kesselring, head of the Luftflotte 2, was determined not to let this convoy pass, so he sent his Stukas to dive bomb it. A large force of Bf 109s was ordered to clear the way for the Stukas by drawing the Spitfires of the 65 Squadron down from their patrol height. The Stukas were then free to dive bomb without enemy opposition. Only two ships of the entire convoy reached their destination undamaged.

You're on patrol at 2000 feet over the convoy. Concentrate on the attacking Stukas at high altitude. Avoid the fire from the intercepting Bf 109s.

Initial Aircraft/ship Position

2 ships that you are protecting are directly north of you at 5 miles.

You are flying SW at 2000 feet.

2 Bf 109s are directly ahead of you flying north at 1000 feet at 7 miles.

2 Bf 109s are ENE at 9 miles heading west at 1000 feet.

3 Ju 87 Stukas are SSE at 10 miles heading north at 8000 feet at 10 miles.

Strategy

The first group of Bf 109s is heading straight for you from the south. The second group of Bf 109s are heading directly at you from the east. The primary targets in this mission are the Stukas at 8000 feet heading north to the convoy. Immediately head SSE and increase power to 100%. Begin a maximum rate of climb to intercept the Stukas. The Bf 109s can't climb as fast as you, so this will give you enough time to take out the Stukas before they reach their target. After the Stukas have been eliminated, conserve your ammo. Another wave of 5 Bf 109s joins the engagement later on. If you take the battle of the remaining Bf 109s over the ships, the ships will fire anti-aircraft guns at them, and hopefully, eliminate a few of them in the process.

July 26, 1940

Weather: Rain

Official Losses: Luftwaffe—4; RAF—2

It's not a good day for flying and there are only a few attacks on the Channel. The British decide to suspend daylight shipping operations.

July 27, 1940

Weather: Clear, changing to Stormy

Official Losses: Luftwaffe—4; RAF—1

The Luftwaffe sinks two destroyers and damages a third.

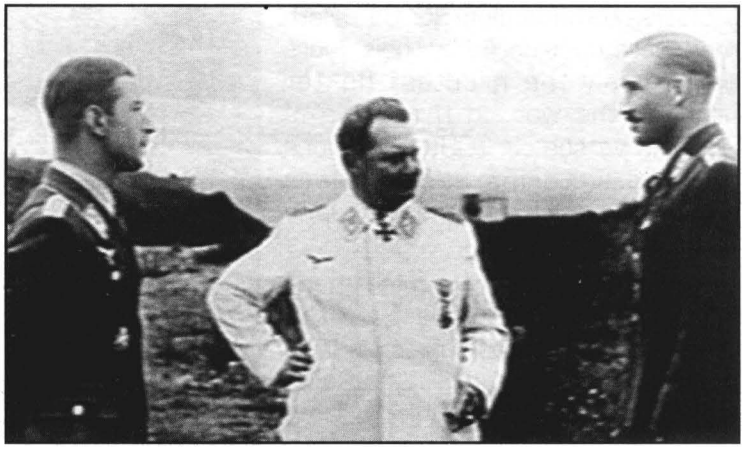
July 28, 1940

Weather: Clear

Official Losses: Luftwaffe—18; RAF—5

The targets for this day included some shipping and port towns. However, the encounter of the day was the meeting of two great aces of the war: "Sailor" Malan and Werner Mölders. Mölders

"Sailor" Malan.



Mölders, Göring, and Galland.

had just become Kommodore of JG 51, the youngest of his rank in the entire Luftwaffe. He flew bomber escort along with four *stafeln* of Me 109s.

Sent up to meet this raid were 12 Spitfires from 74 Squadron based at Manston. The Spitfires, led by Malan, were vectored onto the 109s while Hurricanes attacked the bombers, as was consistent with RAF tactics.

Both Mölders and Malan made quick kills, but, as Malan was finishing off his victim, he found Mölders on his tail. Turning into the attack, he was able to rake the Messerschmitt with his gunfire. Mölders was injured and had to nurse his plane back to his base at Wissant. He was hospitalized, and did not claim another victim until a month later.

Later, following the instructions issued by the Air Ministry on July 14, several Hurricanes of 111 Squadron shot down a German rescue plane and damaged another. This caused considerable backlash and there were even British pilots who stated that they would refuse such an order.

Several of the Luftwaffe losses for this day were attributed to ground fire, to accidents on take-offs or landings, and to factors other than the guns of the Fighter Command planes. The toll was heavy, whatever the cause.

SPITFIRE MISSION 2

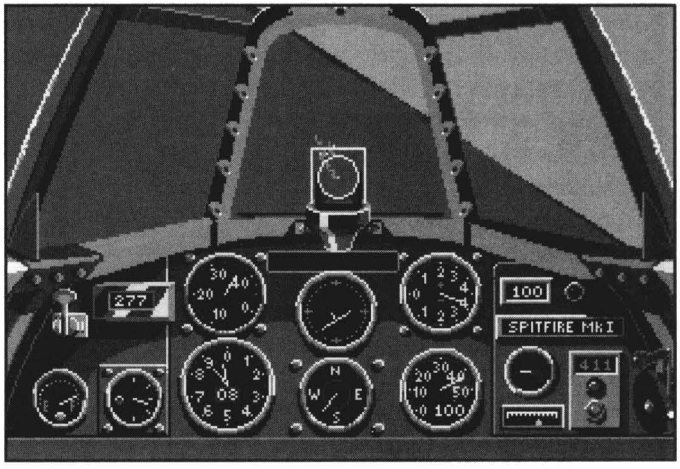
Engage one of Luftwaffe's top aces, Werner Mölders, and his *staffel* of experienced Bf 109 fighters in a fierce dogfight.

Historical Engagement

On July 28, 1940 a unique dogfight took place between two of the top ace pilots on each side. "Sailor" Malan, leading 74 Squadron based at Manston, clashed with Werner "Vati"

Mölders commanding JG 51. Both men were considered by their peers as possibly the greatest fighter pilots of the war. In the battle of Spitfires versus Bf 109s both sides claimed victories and Molders barely nursed his damaged plane back to Wissant.

You begin your mission on patrol at 10,000 feet over the English Channel. Your objective is to shoot down as many Bf 109s of Mölder's JG 51 as possible.



Line up a good shot from behind the 109.

Home Airfield

Lympne 11 Group Satellite. Airfield

Initial Aircraft Position

You and your escort aircraft are flying at 12,500 feet heading south.

1 Bf 109 is directly behind you (North) at 10,000 feet heading SSE at 8 miles.

2 Bf 109 are ESE (10 o'clock position) of you heading Northwest at 10,000 feet at 7 miles.

2 Bf 109 are SSW (1 o'clock position) of you heading NNW at 10,000 feet at 5 miles.

Strategy

The first group to encounter is the Bf 109 at the 1 o' clock position. Mölder's aircraft is located in the group directly north of you at the 6 o'clock position. Conserve your ammo. With only one other aircraft on your side, you can't afford to make bad shots against 11 aircraft. This mission is easier to fly with an experienced wingman at your side. Tight turns will usually make your enemy on your tail fly by. You can even use your flaps to increase this effect. Once the enemy goes by, turn in the opposite direction in a steep turn to line up for the shot. Wait until you see sufficient detail in the plane and your sight is on the money before shooting. If you run out of ammo, running for home won't make them go away. Your only chance is to bail out once you're over English soil.

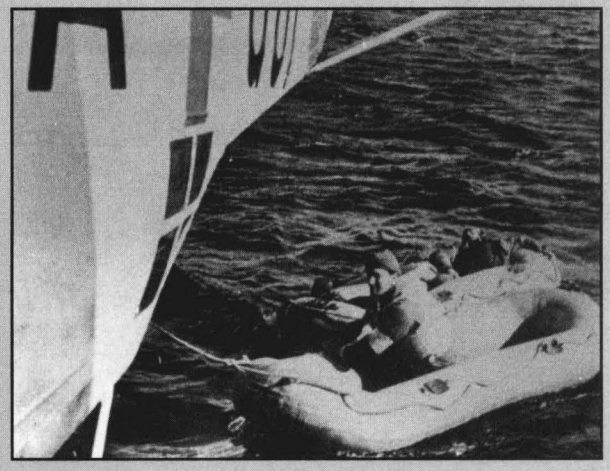
BF 109 MISSION NO. 5

Engage one of the RAF's top pilots, "Sailor" Malan, in running battle for air supremacy over the Channel.

Strategy

All you need in this mission are basic dogfighting skills. See the previous mission for a cross-reference.

The Rescue Services



On both sides, the need to rescue fallen pilots and crew from the deadly chill of the Channel waters was recognized. The Germans had sea-planes like the He 59s and the Do 18 flying-boats. These were painted white with large red crosses to identify them as rescue craft. However, the British did not trust the German integrity and issued a statement on July 14.

"Enemy aircraft bearing civil markings and marked with the Red Cross have recently flown over British ships at sea and in the vicinity of the British coast, and they are being employed for purposes which His Majesty's Government cannot regard as being consistent with the privileges generally accorded to the Red Cross.

His Majesty's Government desire to accord to ambulance aircraft reasonable facilities for the transportation of the sick and wounded, in accordance with the Red Cross Convention, and aircraft engaged in the direct evacuation of the sick and wounded will be respected, provided that they comply with the relevant provisions of the Convention.

His Majesty's Government are unable, however, to grant immunity to such aircraft flying over areas in which operations are in progress on land or at sea, or approaching British or Allied territory, or territory in British occupation, or British or Allied ships.

Ambulance aircraft which do not comply with the above requirements will do so at their own risk and peril."

Of course Goebbels and others were suitably, and publicly outraged at this statement. However, it was also the case that some of the best gunners were employed as crew in these planes and many Hurricanes and Spitfires were shot down in the vicinity of these rescue craft.

On the British side, the need for rescue efforts became officially recognized soon after the Battle commenced, but was not as well organized as the German effort. Small boats were alerted to watch during the battles, and many pilots were rescued. Unfortunately, not all were, and many died in the cold water after having survived all the violence and risk associated with their battles in the air.

A Ju 88 and Bf 109 escort crossing the Channel.

July 29, 1940

Weather: Clear
Official Losses: Luftwaffe—8; RAF—3

The Luftwaffe launched a heavy attack on Dover and some nearby convoys. In a morning attack, 50 Ju 87 Stukas with high escort of 80 Me 109s attacked. The ensuing battle with Spitfires and Hurricanes must have been incredible to witness, but almost equally incredible is the fact that only four Stukas and one Spitfire were actually downed. Of course, many more aircraft were damaged on both sides.

Soon after this first attack, Ju 88s attacked one of the convoys, though not successfully. They lost two planes—one to the anti-aircraft guns and one in a collision with a balloon cable.

Also on this day, a special elite force, Erprobungsgruppe 210, made its first attack on a large convoy in the Thames Estuary. This force consisted of Me 109s and Me 110s.

July 30, 1940

Weather: Clouds and Light Rain
Official Losses: Luftwaffe—5; RAF—0

Some attacks are made on shipping and Hitler tells Göring to be prepared to intensify the action.

July 31, 1940

Weather: Clear
Official Losses: Luftwaffe—5; RAF—3

Some attacks are made on the balloon barrage at Dover and on various shipping targets.

August 1, 1940

Weather: Clear, but limited visibility
Official Losses: Luftwaffe—9; RAF—1

Various attacks are made on shipping. Even more significant were the events that took place in the halls of power. Hitler met with Admiral Raeder who, clearly saw the futility of attempting an invasion of Britain any time soon, though one source has indicated that he may have favored an invasion of England in May of 1941, but Hitler had his eye on Russia at the time. He wanted to see if a quick knock-out could be applied to England. If not, then he would attack Russia and save England for next year. What resulted was Hitler's Directive 17 which states that the Luftwaffe is to "overpower the English air force with all the forces at its command, in the shortest possible time." The invasion of England is set for September 15, based on the Führer's final decision. The *Adlerangriff* (Eagle Attack) was to begin on or after August 5th, depending on the weather. Among the provisions of Directive 17 were specific orders:

- Attacks were to be intensified on the RAF, including attacks on airfields, supply depots, and factories.
- With the destruction of the RAF, all ports, other than those specified for German use, were to be destroyed.
- There must be no unauthorized raids on the British populace as a whole, and London, in particular, was off-limits.

Meanwhile, Göring had given some thought to his attack strategy, though, typically, he had not devised a full plan. However his approach was to attack air bases increasingly closer to London, and he anticipated an easy and quick victory which would make the planned invasion a simple occupation. On this day, Göring met with his high commanders—Osterkamp, Kesselring, and Sperrle—brushing aside all objections or negativity.

August 2, 1940

Weather: Clear, some light rain over water
Official Losses: Luftwaffe—4; RAF—0

More shipping attacks and night bombing. Göring passes on the details of Adlerangriff to the Luftwaffe.

August 3, 1940

Weather: Some Clouds
Official Losses: Luftwaffe—4; RAF—0

Some attacks on shipping. A further order came down from Luftwaffe headquarters identifying the radar installations on the English coast as prime targets.

August 4, 1940

Weather: Clear
Official Losses: Luftwaffe—0; RAF—0

A quiet day, with no losses. The calm before the storm?

August 5, 1940

Weather: Clear
Official Losses: Luftwaffe—6; RAF—1

Some attacks are made on shipping, but the awaited *Adlertag* does not materialize.

HURRICANE MISSION 4

A Stream of Ju 88s escorted by Bf 109s make bombing runs against a convoy.

Historical Engagement

On August 5, 1940 a convoy was sailing through the Straits of Dover during the early afternoon. Hurricanes of the 151 Squadron were on patrol protecting it. Several Ju 88s made a bombing run with an escort of Bf 109s from JG 54. The Hurricanes efforts were successful in driving off the attack with several Ju 88s shot down. The convoy arrived without loss or damage.

Attack the formation of Ju 88 bombers attacking your convoy. Their attack formation is spread out so each bomber is attacking alone with a Bf 109 escort. Follow your flight leader by gaining altitude to the level of the approaching attack and bringing down the bombers.

Starting Positions

You and your flight leader are on patrol at 10,000 feet over the convoy.

1 Ju 88 is at 12,000 feet heading west 11 miles east of you.

1 Bf 109 is at 12,000 feet heading WNW 11 miles East of you.

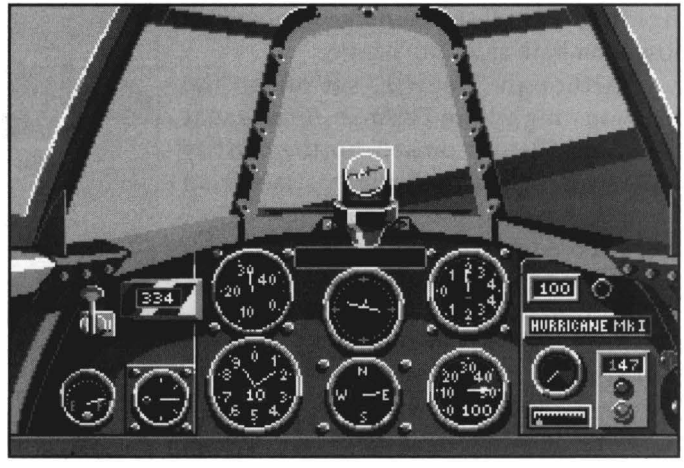
1 Ju 88 is at 10,000 feet heading West 17 miles East of you.

1 Bf 109 is at 10,000 feet heading WNW 17 East of you.

1 Ju 88 is at 12,000 feet heading West 23 miles East of you.

1 Bf 109 is at 12,000 feet heading West 23 miles East of you.

Strategy



When you start this mission, you and your flight leader are directly over the convoy. The first wave approaches from the East. Your flight leader will make a minor course adjustment to the North and begin his gradual climb to 12,000 feet to meet the first Ju 88. Increase your RPMs and follow him. You won't have much time to destroy the first Ju 88. Concentrate your fire in a head-on shot, then turn sharply to finish him off from behind. Don't worry about the Bf 109. The priority is the bombers. The second wave comes in right behind the first bomber but slightly lower—10,000 feet. Don't let your altitude drop below 8,000 feet, or you'll never gain the altitude back to take on the third and final wave at 12,000 feet. The bombers are big, but they're hard to take down. Try placing your shots at the cockpit or the engines. The remaining Bf 109s can be tackled once the bombers have been neutralized. Having a good flight leader is important in this scenario. He can inflict heavy damage on the bombers as well as the fighters if he's good enough.

August 6, 1940

Weather: Cloudy and Windy

Official Losses: Luftwaffe—1; RAF—1

Another relatively quiet day, with scattered attacks on shipping. Göring schedules *Adlertag* for August 10, or when three days of good weather can be anticipated.

August 7, 1940

Weather: Cloudy
Official Losses: Luftwaffe—2; RAF—0

More shipping is attacked, but no major encounter. The convoy code-named "Peewit" takes off under cover of darkness from the Thames. They were escorted by two destroyers.

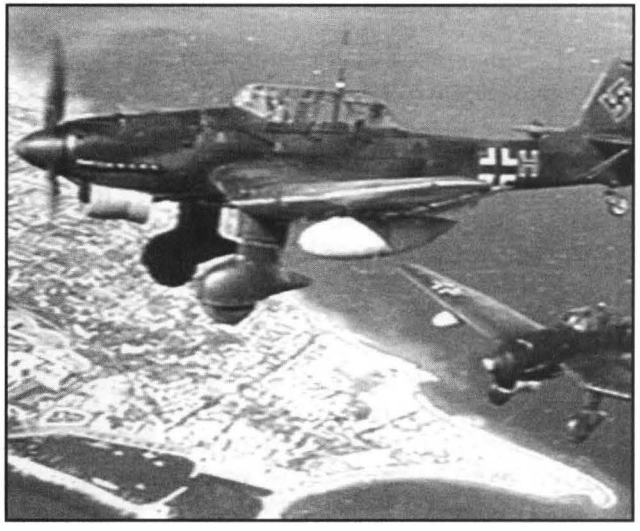
August 8, 1940

Weather: Intermittent Clouds
Official Losses: Luftwaffe—31; RAF—20 (some sources say 19)

After days of waiting and anticipation, August 8th turns out to be a day of heavy fighting. It is not yet *Adlertag*, but the losses on both sides are heavy.

Although "Peewit" set off on the previous night, the German *Freya* radar based at Wissant picked up the convoy and by dawn they were under attack from German torpedo boats which sank three ships and damaged another trio.

Headed by the famous Wolfram von Richthofen (cousin of the WWI ace, Manfred von Richthofen), Fliegerkorps VIII attacked the convoy with their Ju 87s. However, because of low cloud cover, harassment by five squadrons of 11 Group fighters, and the balloon defenses, the dive-bombers were ineffective.



Ju 87 Stukas.

In the middle of the day, another attack appeared. With some 30 Me 109s and a few Me 110s, three *geschwader* of Ju 87s attacked. The defensive force of about 30 Hurricanes and Spitfires were met by the German fighters while the Stukas successfully bombed the convoy. Within minutes the accurate dive-bombers had destroyed four merchant ships and damaged many more.

Von Richthofen returned to the attack later, this time with 82 Ju 87s and an equal number of fighters. By now the convoy is scattered and the balloons are no longer an obstacle. By the end of the day, only four of the original twenty ships of "Peewit" made it safely to their destination. Another six were able to limp into nearby ports, but the convoy was a shambles. What made this all the more poignant was that it was completely unnecessary. The whole idea of sailing this convoy had been for prestige purposes—to show that the British still held the Channel. All the cargo these ships carried could just as well have been transported by train.

Also on this day, Dowding's Order of the Day stated: "The Battle of Britain is about to begin. Members of the Royal Air Force, the fate of generations lies in your hands."

In his book, **Their Finest Hour**, Edward Bishop recounts one tale of this battle. "To Squadron Leader JRA Peel leading No 145 Squadron of Hurricanes, the Stukas seemed like a swarm of little black dots as the British fighters dived. Larger and larger the dots grew until each enlarged into the vulture-like outline of a Stuka, the Ju 87 dive-bomber.

"'Look out, 109s!' The Hurricane pilots in the moment of pouncing on their slow, defenceless prey, were themselves in the gunsights of the German fighters. The hunters had become the hunted. Stepped up in the sun the Me 109 pilots, the guardian angels of the Stukas, had seen what was about to happen. In seconds they were on the tails of the Hurricanes, forcing the RAF pilots to break off and defend themselves. Squadron Leader Peel, jumped by two Me 109s, reported 'The enemy fighters were half-rolling and diving and zooming in climbing turns. I fired two five-second bursts at one and saw it dive into the sea. Then I followed another up in a zoom and got him as he stalled'. But they got Peel. He came down in the sea close to the enemy coast at Boulogne. When rescue boats reported they would probably have to turn back, Peel's Squadron signalled, 'Tell the boats they'll be shot up by us if they do'. The Squadron Leader was rescued."

HURRICANE MISSION 7

In a battle against all odds, save a doomed convoy from the lethal bombs of Stuka dive bombers.

Historical Engagement

On August 8, 1940, Luftflotte 3 sent a large force of Stuka dive bombers to attack a convoy code-named "Peewit" south of the Isle of Wight. They were escorted on their mission by Bf 109s from JG 27. The Ventnor radar station alerted the British to the impending attack. Hurricanes from the 145 Squadron made the first contact and furious combat resulted. In tremendous dogfights that lasted 20 minutes, many planes were shot down, but the Stukas achieved their mission by decimating the convoy.

In your Hurricane above a few stragglers of the "Peewit" convoy, defend against the waves of Stukas that are approaching from almost every direction. Try to avoid the escorting Bf 109s and focus on the dive bombing Stukas.

Initial Starting Positions

You and your wingman are on patrol over the convoy below you at 12,000 feet near the Isle of Wight.

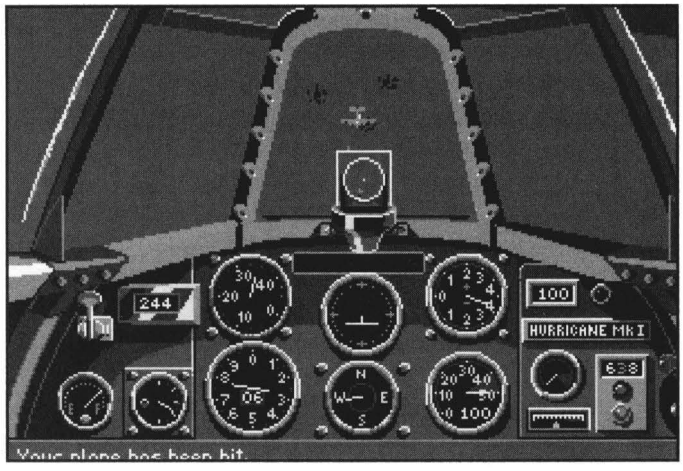
3 Ju 87s are at 8,000 feet heading West ENE of you at 17 miles.

2 Bf 109s are at 10,000 feet heading WNW SE of you at 16 miles.

3 Ju 87s are at 9,000 feet heading NE WSW of you at 22 miles.

3 Ju 87s are at 10,000 feet heading North South of you at 28 miles.

Strategy



You and your wingman should fly ENE to intercept the first group of Stukas approaching the convoy. Be careful not to waste your ammo and make every shot count. Approaching the Stukas from above and behind is your best strategy, but watch out for the tail gunner! Soon after engaging the first group of Stukas the Bf 109s will engage you. Try to avoid them if possible, but protect your wingman. You'll need him later on in the mission. The next group of Stukas attack WSW of you. Head in that direction, and try to engage them as far away from the convoy as possible. Once they start their dive bombing attack, it's difficult, if not impossible to shoot them down. Another group of Stukas will appear over enemy territory, but they're far enough away to forget about at this point. If you've lost any altitude, you'll want to climb to at least 8,000 feet to engage the next group. The third group is slightly higher than the second, you must climb to at least 9,000 feet to engage them. The last group is at 12,000 feet. If you're lucky enough to destroy the only Bf 109 escort between the the first and second group, then you have a good chance of completing this mission with at least one ship left in the convoy. This mission is very difficult because the groups come from all directions, and they are so spaced out. You need to plan not only your attack strategy, but how far you can travel to meet each group. If you're not careful, you could be spending the entire mission flying from place to place without firing a shot!

August 9, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—5; RAF—4

With bad weather, only small attacks on shipping take place and *Adlertag* is put off.

August 10, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—0; RAF—0

More bad weather means little action.

August 11, 1940

Weather: Clear

Official Losses: Luftwaffe—38; RAF—32

On this day, as *Adlertag* approached, the fighting was heavy—inflicting the heaviest toll of aircraft so far. Several of the best-known RAF aces, including "Sailor" Malan, Peter Townsend, and Alan Deere shot down Luftwaffe aircraft that day, but the Germans sent in a very large force and were successful at bombing their targets.

SPITFIRE MISSION 1

Small wave of He 111s escorted by Bf 109s attack the Spitfire factory near South Hampton.

Historical Engagement

Aug. 11, 1940 the Luftwaffe sent its largest raid yet against England, upwards of 165 aircraft including Ju 88s and He 111s escorted by Bf 109s and Bf 110s. The RAF countered with as many Spitfire and Hurricane squadrons it had available. The German fighter escort succeeded in attracting the attention of the intercepting RAF fighters and allowed the Ju 88s and He 111s to slip through and bomb targets in Portland, Weymouth, and the Southampton area.

You begin the mission on patrol at 12,500 feet. Your objective is to take care of the Bf 109s while your escorts take care of the He 111s.

Home Field

Warmwell 10 Group Satellite. Airfield

Initial Aircraft Position:

Your aircraft is flying at 12,500 feet heading south.

1 Spitfire is behind you (North) at 11,000 feet heading South at a distance of 5 miles.

1 Spitfire is off your left wing (East) at 12,000 feet heading SW at a distance of 13 miles.

1 He 111 leads the first wave at 10,000 feet heading North. Intercept distance is 8 miles ESE.

2 Bf 109s are directly behind the He 111 at 12,000 feet heading North. Intercept distance is SE at 10 miles.

1 He 111 leads the second wave at 10,000 feet heading NNE. Intercept distance is 12 miles heading South.

2 Bf 109s are directly behind the He 111 at 12,000 feet heading NNE. Intercept distance is south at 13 miles.

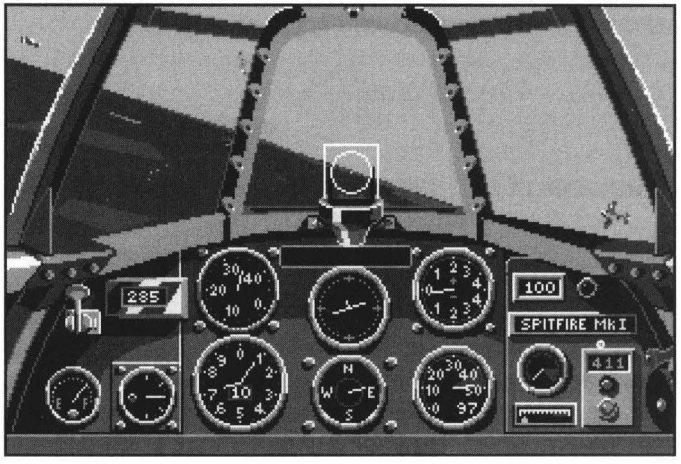
1 He 111 leads the third and final wave at 11,000 feet heading NNW. Intercept distance is 21 miles heading SE.

2 Bf 109s are directly behind the He 111 at 11,000 feet heading NNW. Intercept distance is 22 miles.

Strategy

Take out the fighters so your escorts can take care of the bombers. Temptation may overcome you to take a few shots at the bomber since it's the first aircraft you see. Don't give in!

Keep your altitude high. The first wave is lower than the succeeding waves. If you let your altitude drop too much you'll be spending most of your time climbing to catch the succeeding waves. By that time, it'll be too late.



If you don't take care of the 109s, they'll take care of your squadron.

It's imperative that you stick with the game plan. The fighters will gang up on your escorts unless you take care of them. A fighter may try and lure you away from the action by running. Stay with your escorts and take out the fighters that threaten them first. Once the threat is removed you can go after the secondary targets.

HURRICANE MISSION 2

Your "Vic" of Hurricanes clashes with a "Schwarm" of Bf 109s.

Historical Engagement

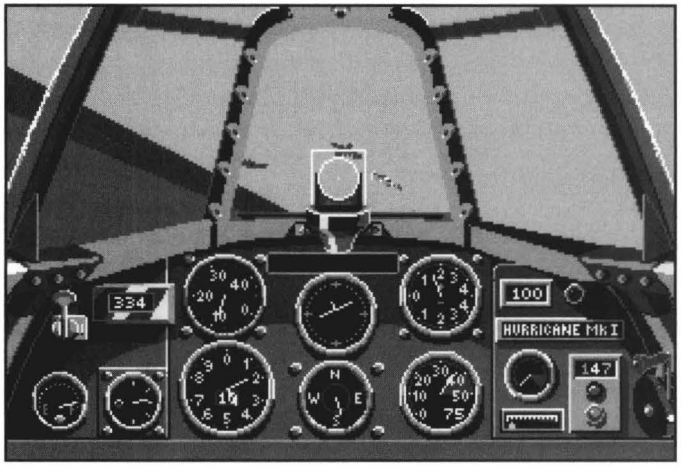
August 11 was a day of many dogfights between the RAF and the Luftwaffe fighters. While on patrol over the Dover Straits the Hurricanes of the 32 Squadron were suddenly pounced upon by a *staffel* of Bf 109s. The Hurricanes did well just to escape without any losses.

Protect the flight leader and the other wingman in your "Vic" formation of Hurricanes as a "Schwarm" of Bf 109s close in around you. Watch for Bf 109s closing in on their tails. No plane is covering your tail so be on the lookout for fighters attacking you, the "Tail-end Charlie".

Inititial aircraft positions

Your flight leader, wingman, and you are on patrol at 10,000 feet over the Dover Straits.

5 Bf 109s surround your group at various altitudes from 12-15,000 feet.



Be careful not to shoot friendy aircraft!

Strategy

Follow your wingman and flight leader to engage the closest Bf 109 slightly behind you on your left. Make certain that you keep the Bf 109s from destroying any planes in your group by watching their tails. Make sure your shots are clean and that your group aircraft are far enough away so they won't get hit by any of your stray bullets.

BF 110 MISSION 7

Attack a convoy then protect a group of Dorniers on their bombing run on the same convoy.

Strategy

As you approach the convoy, line up on the first ship nearest you in the convoy. Set your gunner on automatic and commence your bombing run. Once you've dropped your bombs, dogfight the Hurricanes that are now over the convoy. Once this group is destroyed, head for your approaching bombers, and protect them from attack. As long as the bombers are not severely damaged, they'll make at least one hit on the furthest ship in the convoy as long as they're not harassed by the attacking Hurricanes. Once the bombers have completed their run, stay close to them for the return trip home and engage any Spitfires that come in range.

THE ACTION HEATS UP

This ends one phase of the Battle. The next day, the 12th, sees massive attacks on the RDF network and the forward airfields in preparation for *Adlertag*. Eagle Day is only about 36 hours away.

Chapter 5
Adlerangriff: The Eagle Attacks

August 12, 1940

Weather: Clear

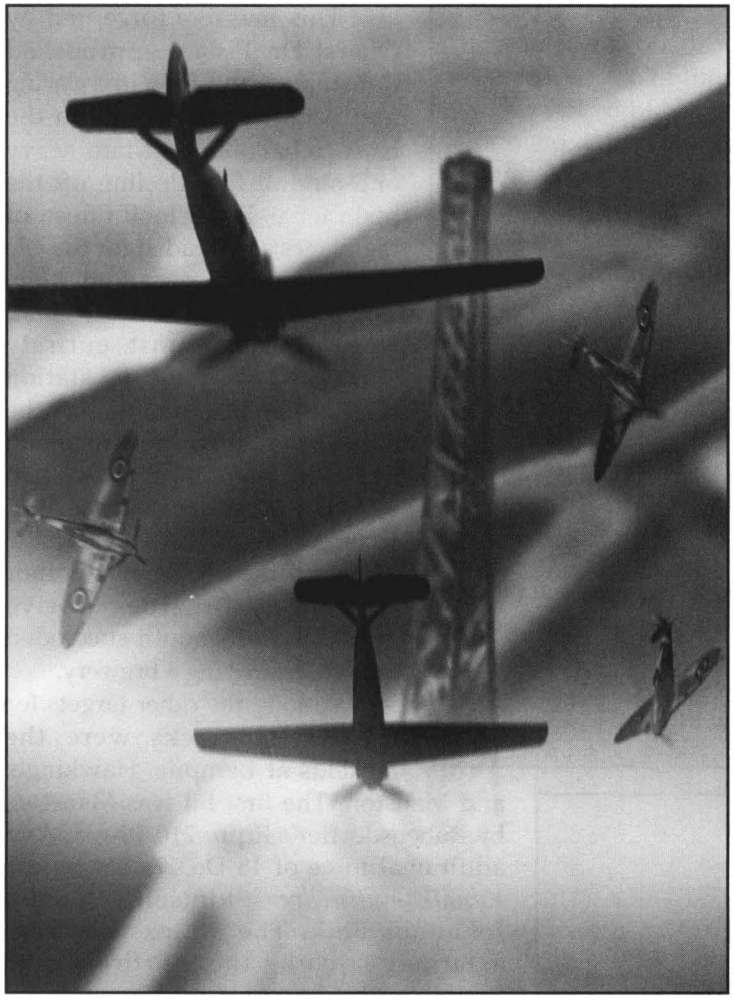
Official Losses: Luftwaffe—31; RAF—22

This day, the eve of Adlertag, was a critical day for both sides. The German spirits were high, and none among them doubted that their cause would be successful. Göring himself was to preside over the day's activities with Kesselring and Sperrle, all done up in formal military regalia.

Although a night bombing mission of He 111s had lost several key officers and crew, that was not mentioned or considered at High Command that morning. Me 109s had flown low over the English countryside early, but now it was time to initiate the attacks that would prepare the way for the grand event to come.

The idea here was to blind the British by knocking out their radar in preparation for the next day's attacks. Although they still did not fully understand what made the British radar so effective, the Germans had come to realize that it worked all too well. However, they deemed it an easy task to destroy the radar defense, and then swoop down upon the hapless, and blinded, British. Their plan was not bad. In fact, the attacks of August 12 were the most devastating so far.

At around 8:40 A.M. Hauptmann Walter Rubensdörffer took his elite Erpro 210 in a bombing run at four main radar installations—Dunkirk (Kent), Pevensey, Rye, and Dover. The formation of 16 Jabo fighter/bombers headed over the Channel, then split into four groups of four planes. Each group had its own target. They swooped over the unprotected RDF stations and dropped their 250 lb and 500 lb bombs with pinpoint accuracy. Buildings were leveled and several power and communication lines were severed. To any outside observer (including the pilots of Erpro 210) the devastation was complete. These RDF stations could be marked off the map. However, the miracles of the Battle of Britain never seemed to cease. The lattice-work sending and receiving towers proved almost impossible to destroy with the explosive charges dropped by these planes. Despite the destruction, Dover never even stopped transmitting, and two other stations were soon up and running on emergency generators. Only Ventnor was out of operation for a day.



At Dover, AC2 Clifford Vincent was on watch duty high up in a radar mast, with views far to the north overland and across the Channel to enemy soil. 'Vincent just had time to marvel at the sight of the rapidly approaching fighter-bombers before the masts rocked from the explosions around their bases and the shrapnel went clanging through the girderwork. As the dust and smoke cleared, he looked below to where Flight Lieutenant Peter Axon was shouting and gesticulating to him to climb down.'

There was no need to hurry. None of the towers had more than superficial damage, and it was the same at the other three stations. Lattice-work radar towers, so visible and seemingly so vulnerable, were proving almost immune to high explosive. (**Harvest of Messerschmitts.**)

At the same time, German long-distance artillery began to fire upon Dover for the first time.

His intelligence reports confirmed the success of the missions, so Kesselring decided to send a test attack at some convoys. In fact, there was radar still working, but the system failed for once, and the defenders were not on time to prevent one of the attacks. The other was driven off, but at a cost of five Hurricanes and two pilots.

However, the main attacks of the day were launched at key inland and coastal targets including several airfields, naval bases at Portsmouth and Portland as well as several industrial targets, including the Supermarine Spitfire works at Woolston. Another target was the Ventnor radar station on the Isle of Wight.

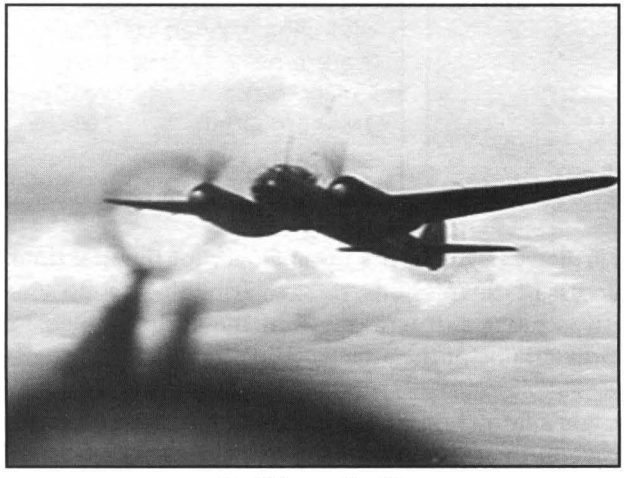
This attack was missed in the confusion of repairing the damaged RDF stations, but the dependable Observer Corps spotted the amassing horde of planes—100 Ju 88s escorted by about 120 Me 110s and 25 Me 109s. A defensive force of more than 50 Hurricanes and Spitfires was scrambled to meet the attack.

"It was the Rye radar that picked them up. It was noticed that the track was heading straight at them. The 19-year-old girl operator was slightly irritated by the way in which the Filter Room, at Fighter Command, gave the plot an X code. That meant a report of doubtful origin: possibly friendly aircraft, or a mistake.

"The first element of four Messerschmitts peeled off from the formation and dropped towards the 350-foot-tall masts at Dover. Their well-placed bombs rocked the pylons and destroyed some of the huts.

Rubensdoerffer took the next element north across Kent to the inland RDF station at Dunkirk, Kent. One of these Jabos dropped a bomb so close to the transmitter block that the whole concrete building moved two or three inches. There were other hits on the huts there.

At Rye the operators were still watching in fascination as the plot came nearer and nearer. Suddenly bombs began to fall upon them. Almost every building was hit, except the transmitting and receiving block. The Filter Room called repeatedly into the phone to find out what was happening. 'Your X raid is bombing us,' explained the girl primly." (from **Fighter**.)

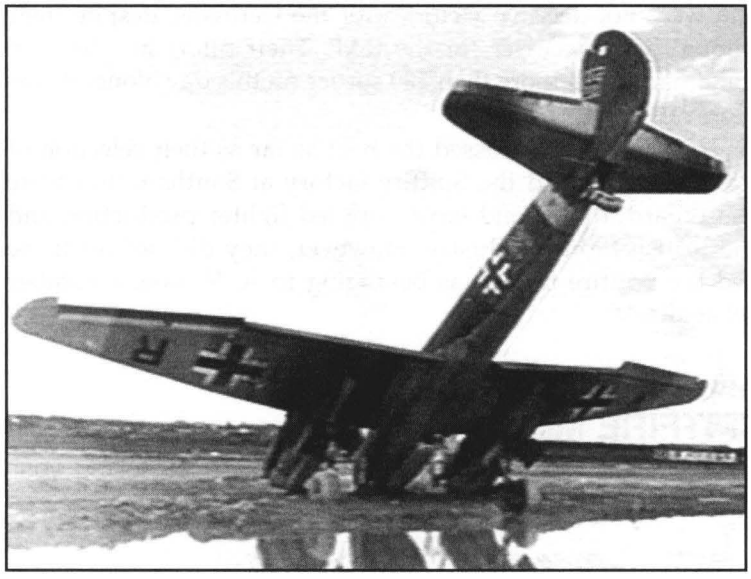


Stalking a Ju 88.

This massive force, led by Oberst Dr. Fisser, approached Portsmouth and flew in a daring approach through a gap in the barrage balloons and into heavy anti-aircraft fire. Peeling off the main force, Fisser took fifteen of the planes and headed for the Isle of Wight on a separate mission. The attack on the Ventnor RDF station was almost entirely successful, keeping the station off-line for three days, but the cost to the Luftwaffe was great. They lost many Ju 88s, but also several leaders including Fisser, Kommodore of KG51. Ironically, although the attack on Ventnor was successful, the massive attack on Portsmouth succeeded only in destroying a brewery.

Among the other targets for the day's attacks were the airfields at Lympne, Hawkinge, and Manston. The first hit was Manston, by Rubensdörffer's Erpro 210 *Jabos* and an additional force of 18 Do 17s led by the *Kanalkampffuehrer* himself, Oberst Johannes Fink. The attack was devastating, catching the Spitfires of 65 Squadron by surprise on the runway. Miraculously, all the Spits took off through the clouds of smoke and dust as bombs flew everywhere—all except one which had had its propeller reversed by a bomb blast. Despite the lucky escape of the pilots, the airfield was a shambles, absorbing nearly 150 bomb blasts, and the raiders escaped practically without losses.

In **Fighter**, Len Deighton's account of the Battle, he speaks of just how devastating this attack on Manston was to the morale of the ground crew, many of whom would not leave the shelters for days. However, the air crew, instead of resting, took on the tasks of any missing ground



***The end of a Ju 88* zerstroerer.**

operations. However, this points to the fact that, despite the many stories of bravery and the image of the British as "cool under pres-sure," there was incredible terror as these days of the war began. Not every man is brave, and it makes all the more remarkable the incredible efforts put out by the RAF pilots, many of whom seemed totally fearless.

Just as the RAF's Inspector General (Air Chief Marshal Sir Edgar Ludlow-Hewitt) was arriving for an official inspection of Lympne, Ju 88s flew over and began bombing for the second time that day, to be followed by high-altitude attacks from Do 17s. Runway craters that had been created by the first attack and then hastily filled in preparation for the Inspector General's visit were now reopened while Ludlow-Hewitt rode out the storm in a shelter. After the attack, he promised to return "in a few days' time."

Previous to his visit at Lympne, the Inspector General had visited Hawkinge, and, despite the hundreds of contrails that streaked the sky, had kept the airfield on alert, not so much for enemy bombs, but for any mistakes in protocol. As he left and headed for Lympne, the Ju 88s roared over Hawkinge, and, although several squadrons of Spitfires were already aloft and ready for the attack, the Ju 88s were able to hit the airfield squarely and escape without serious interference.

Back at the German High Command, Kesselring and Sperrle were convinced that these raids had been successful, and they were all too ready to cross the RDF stations at Dunkirk, Pevensey, Rye, Dover, and Ventnor as well as the airfields at Lympne, Hawkinge, and Manston off their maps as destroyed forever. But in subsequent test raids, they were profoundly disappointed to find that the RAF scrambled their squadrons exactly as efficiently as before. The "destroyed" targets were, in almost every case, back in operation the same day. Only Ventnor was out of action for several days, and to fool the enemy, another radar station continued sending their signals.

Amid the devastation at Hawkinge and Lympne, the airborne pilots still had to land. And the unflappable nature of the British and low-key sense of humor may have eased some of the horror of the situation. Take the case of Squadron Leader Mike Crossley, who needed to land at Hawkinge despite the situation. As Hough and Richard report the incident, "OK," replied the controller apologetically, "but you see how we are." He added, perhaps unnecessarily, "Try and avoid the craters."

In retrospect, the actions of the 12th were not decisive victories for the Germans, despite their ferocity, but neither were they unqualified successes for the RAF. Their pilots had been in operation more or less continually and had flown more than 500 sorties on this day alone. It was not a situation that could continue forever.

On the plus side, the Germans had figuratively missed the boat as far as their selection of targets. Both the Rolls Royce factory at Derby and the Spitfire factory at Southampton were primary targets. If they had hit these hard, they could have crippled fighter production and perhaps dealt a mortal blow to the British fighter industry. However, they did not hit these targets, and, in fact had mislabeled the Spitfire factory as belonging to A. V. Roe, a bomber manufacturer and not a prime target at all.

SPITFIRE MISSION 7

As you take off from Manston, Bf 110s and Do 17 bombers are both attacking your airfield.

Historical Engagement

Monday, August 12th, 12:50 P.M. As the Spitfires of the 65 Squadron rolled towards their takeoff, a group of Bf 110 fighter-bombers swept across the field, bombing and strafing. Moments later, a medium level attack by the Do 17s of KG 2 covered the field with 250 kg bombs. Scarcely any Spitfires made it aloft. Oddly, few RAF planes were hurt and the airfield was back in service 24 hours later.

As a pilot of the 65 Squadron, try to scramble into the air and meet the oncoming enemy aircraft. Turn Northeast, into the attack, as you pass the building to the left of the airfield. Try to bring down the Bf 110 before they can drop their bombs. Then head for the Dorniers.

Initial Starting Positions

You and your two escorts are on the ground at Manston Airfield.
Two Bf 110s are at 5,000 feet NE of you heading SW to your airfield at 6 miles.
Two Bf 110s are at 5,000 feet North of you heading heading South to your airfield at 9 miles.
Two Do 17s are at 4,000 feet NNE of you heading SSW to your airfield at 16 miles.

Strategy

As you take off, you may see one of your escorts bank right and head south. Don't follow him. Instead, climb as quickly as possible and bank left to a NE flight direction. You will see the first wave of Bf 110s approaching. The approaching aircraft are moving very fast, so you'll have to start lining up your shot early, and start shooting early. You may want to start shooting as soon as you see white detail in the aircraft. Hitting an aircraft head on is hard. You'll be lucky if you can destroy one of the Bf 110s in the first wave.

After the first wave has passed you, continue heading North towards the second wave of Bf 110s. Your escorts, if they're good, will take care of the enemy over the airfield. The earlier you meet the succeeding waves, the more time you'll have to pursue them and knock them down before they reach their target. If, after taking your first run at the second wave, you are unable to inflict sufficient damage or destroy them, you do have enough time to chase them for a minute or two, until the third and final wave of Do 17s approach. Make sure you save enough ammo for the Do 17s because they take more hits to bring down. As long as you can inflict enough damage to make them alter their course, you can spend all day inflicting the final blow. Your escorts will help mop up any remaining aircraft in the area. Just remember the primary objective: Save the airfield!

BF 110 MISSION 4

Raid the forward airfield of Manston and destroy the planes of the Spitfire squadron based there.

Cross Reference: Spitfire 7

Strategy

As you make your approach to the Manston airfield two groups of Spitfires are intercepting you. One group of two Spitfires is approaching from the west, the other group of two Spitfires is approaching from the north. Set your rear gunner position on automatic; continue on your present course and release your bombs just as you approach the second yellow hanger at the airfield. After you drop your bombs, use your dogfighting skills to attack the Spitfires. Don't forget to use your machine guns to destroy the Spitfires sitting on the ground. Once your bombing mission is complete, head for home. You'll probably run out of ammo in your forward guns as more Spitfires approach you from all directions on the return trip home. Use the autopilot and jump into the rear gunner's seat and shoot down as many as you can.

SPITFIRE MISSION 8

On the eve of *Adlertag*, prevent Bf 110s from destroying vital radar stations in the RDF network.

Historical Engagement

The coastal radar stations had top priority on the eve of *Adlertag*. The Bf 110s of the elite Gruppe 210 were selected for this precision bombing mission. The four radar stations of Pevensey, Dover, Rye, and Dunkirk, were attacked by small groups of Bf 110s that slipped

past the RAF fighter patrols. Pevensey, Rye, and Dover were put out of action temporarily, opening the way for other attacks later in the day against the forward airfields.

Intercept the Bf 110 attack targeted for Rye and the neighboring station of Fairlight. The Bf 110s are making a low approach with Bf 109 escort. You are flying as wingman so protect your leader from the Bf 109 attacks and intercept any Bf 110s that slip past him.

Initial Aircraft Positions

You and your flight leader are on patrol at 4,000 feet over the Rye radar station.
2 Bf 109s are at 4,000 feet ESE of you heading west at 12 miles.
2 Bf 110s are at 1,000 feet NNW of you heading SSE at 15 miles.
2 Bf 109s are at 2,000 feet NNW of you heading SSE at 16 miles.
2 Bf 110s are at 1,000 feet NW of you heading SSE at 20 miles.

Strategy

Follow your flight leader to engage the first group of Bf 110s heading for the Rye radar station. As your flight leader heads for the Bf 110s, two Bf 109s will attack him from above. Attack the Bf 109s to provide cover for your flight leader. After your initial run at the attacking Bf 109s, move south to engage the Bf 110s attacking the Fairlight station. Your flight leader should take care of the Bf 110s attacking the Rye station if he's good enough. Having an experienced flight leader in this scenario is a definite plus. As the remaining Bf 110s return home, engage them over the Channel. Be careful though. As you move closer to enemy territory, two more Bf 109s will appear and engage you and your flight leader if he's still alive.

BF 109 MISSION 2

Escort the Bf 110s of Gruppe 210 in their attack on the radar installation at Rye.

Cross Reference: Spitfire 8

Strategy

Try to bring down the Spitfires to the NNW of your position first. Remember, the Bf 110s you are escorting are very vulnerable on the approach.

Move NNW with the Bf 110s and engage the first group of Spitfires as you head toward Rye Chain Home Radar Station, the primary target. Inflict as much damage as possible against this first group, and continue to head NNW to provide cover for the Bf 110s. It's important that you provide close cover for the Bf 110s as they make their bombing run. More Spitfires join the action once the Bf 110s get in range of the target. If you don't provide cover, they'll either miss their target or get shot down. Using

experienced crew members in the Bf 110s will provide some relief in taking out the Spitfires. Another tip is to watch your fuel level. The return to your base is a long haul. You should leave enemy air space with at least 1/2 of your gas remaining. With the sheer number of Spitfires attacking your group, you'll need to make every shot count.

BF 109 MISSION 6

Escort a group of Ju 88 medium bombers on their attack at the Ventnor Chain Home Radar Station.

Strategy

You begin this mission by escorting three bombers over the Channel. They're heading for the Ventnor radar station. You'll want to stick close to the bombers and fight off Spitfires who are going for the bombers. After the bombers have completed their run, follow them back over the Channel. The Spitfires are only interested in the bombers, so if you stick with the bombers you'll always find plenty of Spitfires to shoot at. As the bombers are heading back, they split apart from formation and fly about 7-8 miles apart. This makes it tough for you because the Spitfires also split apart. You'll have to move between each bomber to take out the Spitfires, so conserve your ammo and your fuel. You'll have to keep your RPMs high though to keep up with the group. Concentrate on hitting Spitfires that are just getting ready to dive on the bombers. If you go after a Spitfire that's already diving and shooting, the gunners on the bombers could hit you or stop firing because you're in the way. Or worse, you could hit a bomber with your guns by mistake.

JU 88 MISSION 1

Join a bombing mission aimed at the Ventnor Radar Station on the eve of Eagle Day.

Cross Reference: Bf 109 mission 6

Strategy

In this mission you are a lone bomber attacking a radar station at 4,000 feet. Maintain your current course heading of west and use the pan mode to view the upcoming target. Turn on your auto gunners at all gun locations. When the target is in plain sight switch to the bomber view. As soon as the target appears at the top of the view sight, release one bomb every second. Switch back to pilot and turn left and head for the Channel and your home field. On the way back you can man the gunner positions and take out the numerous fighters waiting to make mince meat out of you!

BF 109 MISSION 8

Three separate Bf 110 attacks against radar installations need your protection.

Strategy

Follow the Bf 110s south to the targets at Pevensey and Beachy Head. Your flight leader will follow the other Bf-110 to Fairlight. Fighters will approach from the south and north to attack the Bf 110s. Keep the fighters busy while the Bf 110s make their bombing run. Your flight leader will join you over the southern targets at Pevensey and Beachy Head, after he takes care of the fighters over Fairlight. Watch the in-flight map for new aircraft sightings and keep in mind the distance between the two groups of bombers.

BF 110 MISSION 3

In a prelude to the "Eagle Day" offensive, attack the Chain Home radar station at Pevensey.

Cross reference: Bf 109 mission 8

Strategy

Take off from the Samer Airfield and head WNW. As you approach the Channel, you'll encounter two Hurricanes. Use your dogfighting skills to bring them down. Having your rear gun on automatic will make it easier. As you get closer to England, expect to encounter as many as 12 Hurricanes along the way. Use your dogfighting skills to repel the Spitfires. You may need to jump in the rear gunner's position from time to time. Especially when there are more than three Hurricanes on your tail. As you make your way to the target, use your bombing skills to destroy the main building at the base of the radar tower. Once your bombs are released, head for home.

JU 87 MISSION 8

Against all odds, attack two ships with your lone Stuka. Many Hurricanes and Spitfires are defending.

Strategy

As a lone Stuka in this mission, you'll have to do some dogfighting as well as bombing to complete it. As you approach the ships, two fighter groups will attack you. Use your rear gunner to fend off the attacking fighters. Once you hear the flak from the ship, turn on your auto gunner and man the pilot position. Use the pan mode to assist you in lining up

on either the first or second ship. Lining up length-wise with the ship will insure a better chance of hitting the ship with your bombs. Once you complete the bomb run, you'll have to dogfight the fighters to make it safely out of the area. Remember to dodge the flak as much as possible. Once the area is clear of the fighters, head for your home field. As you approach home field, another group of fighters will be waiting for you.

DO 17 MISSION 1

In a low level attack, bomb the forward airfield at Lympne.

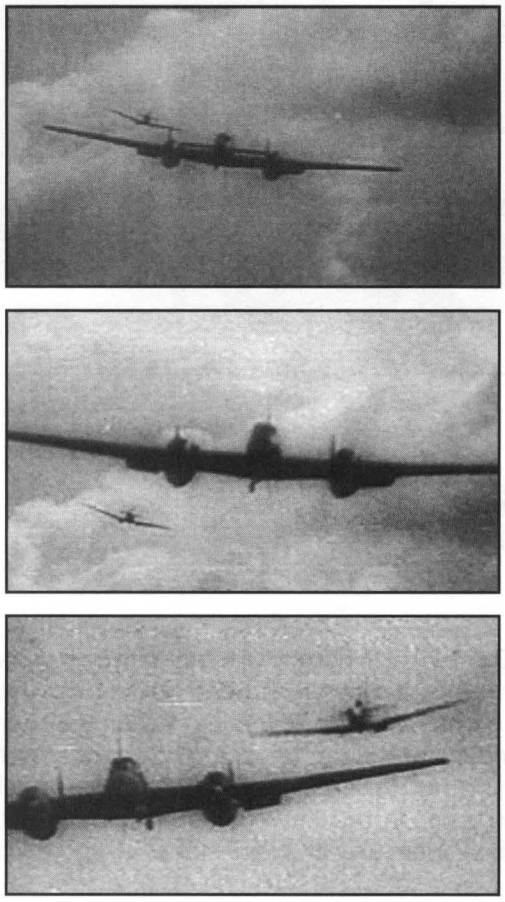
Strategy

In this low level mission, you are following one Do 17 in a bombing mission against the Lympne Airfield at 3,000 feet. Because of the low altitude, you'll need to line up your target fast to give you enough time to drop your bombs. As you follow the other bombers to the airfield, you'll want to turn on your auto gunners and jump back into the pilot's seat. As you begin to see the buildings of the airfield, line up the center bar of your windshield so that it is directly in line with the yellow/red building on the left. You can use the auto pilot to help you center the aircraft. Once the buildings are in plain sight, jump to the bomber position.

As soon as yellow/red buildings are in plain view start dropping one bomb every second, up to two bombs. One of the two bombs should hit the yellow/red building. Then immediately correct your course from the bomber position to line up the yellow building in the crosshairs. This should only take a slight adjustment to the left and then you'll immediately release the two remaining bombs. The other Do 17 should have hit the left yellow/red building so you can start your flight home. Back to the pilot's seat, turn ESE while increasing your RPMs to 100%. Start a gradual climb while you head for the Channel. Level off at about 12,000 feet while leaving your engines at 100% RPMs. The extra altitude can make the difference if you have to glide back to your airfield. The extra RPMs keep your speed up, making the Spitfire's chase you.

August 13, 1940

Weather: Cloudy, then Clear
Official Losses: Luftwaffe—45; RAF—13



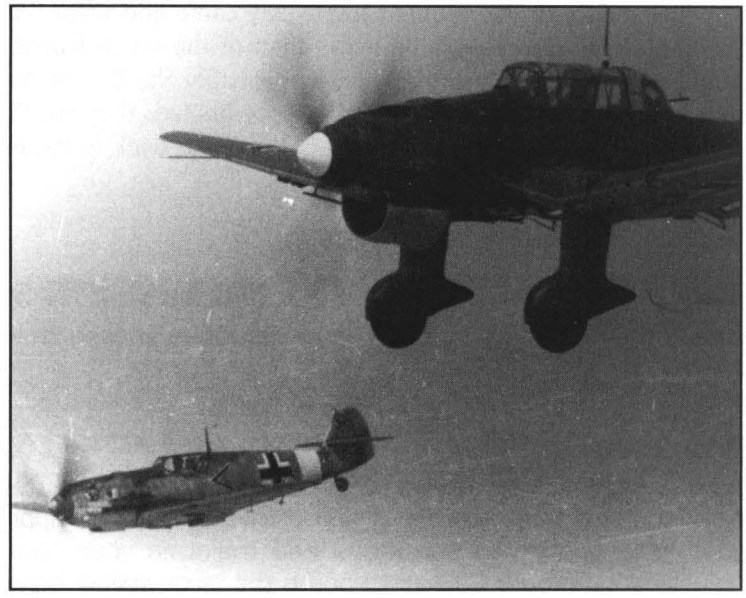
A Spitfire coming up on a Dornier.

The German meteorologists had confidently predicted ideal weather for *Adlertag*. What irony, then, that the day should begin with heavy, thick clouds everywhere. Still, the scheduled dawn raids began to form up in the air. Oberst Fink's *Geschwader* of 70 Dorniers flew up into formation and started across the Channel. Meanwhile, Göring had issued a cancellation of the morning mission which had been relayed by radio. Because of a staff snafu, the Dorniers had not been fitted with the newest crystal for their radios and did not hear the order.

As the Dorniers continued on, Oberstleutnant Huth, a one-legged veteran of World War I (as was Fink), flew wild passes across Fink's nose to get him to turn back, but Fink, formerly a chief accident investigator for the Luftwaffe, presumably disapproved of Huth's actions, but clearly did not understand their intent. Eventually Huth gave up and Fink led his bomber formation across the Channel and into English territory. Benefitting from the cloud cover he flew unassailed and emerged close to his target.

Fink's luck ran out, however, as first 74 Squadron led by "Sailor" Malan, then John Thompson's 111 Spitfire and John Gordon's 151 Hurricane Squadrons attacked. Malan shot down a Dornier in the first pass, and four more were shot down in the ensuing battle. One of them was shot at relatively long range by Roddick Lee Smith in a cannon-equipped Hurricane. Though cannon were not favored, in this case, the pilot's faith in them was rewarded with a kill that was entirely due to the intense power of the cannons as compared to the eight .303 machine guns in an ordinary Hurricane. However, the loss of speed and maneuverability generally prevented cannon-equipped Hurricanes from being effective during the Battle of Britain.

At any rate, this first foray into Eagle Day was a fiasco. In addition to losing five Dorniers over England, five more returned to base too shot up to fly again, and Fink was furious. Kesselring personally apologized to him, but the damage was done.



A Ju 87 Stuka with Bf 109 escort.

After a feint attack by free-ranging Me 109s, the main attack of the day finally began to form later in the afternoon. By 3:30 P.M. a great force of almost 300 aircraft had formed over the Cherbourg Peninsula and the Channel Islands. The targets of this massive attack were the airfields and operations centers of 10 Group as well as the port of Southampton. Two Hurricane squadrons were sent to meet the armada of Ju 88s heading for Southampton, but were unable to head off the mission. Bombs and incendiaries were dropped on the port, causing much damage and loss of life, but the blow was not final, and, as it has been pointed out, the Germans once again missed the most important target—the Spitfire factory at Woolston.

Meanwhile, luck continued to favor the English. Many of the attacking bomber formations got lost and couldn't find their targets. Meanwhile, all the 10 Group squadrons were in the air, and with scattered cloud cover, were hard to find.

The encounters that did occur in the air often favored the British pilots. In one case, George Darley led his Spitfires of 609 Squadron against a formation of Stukas guarded by Me 109s. Dispatching part of his squadron to guard against the 109s, the rest set upon the *Staffel* of Stukas, destroying six out of nine. At least one, maybe several 109s were also shot down.

Not everything went entirely wrong for the Germans. In one highly successful raid, they dive-bombed Detling Airfield in a very well-coordinated effort, killing 67 men and destroying 22 aircraft on the ground. This was a terrible blow, but not to Fighter Command. That's because Detling was a Coastal Command airfield. As terrible as the loss was, it had no effect on the outcome of the Battle. But it did make many people think about their vulnerability. If it could happen at Detling, perhaps it could happen at many other locations of a more critical nature.

On the German side, everything was far from jolly. Senior leaders such as von Brauchitsch, Rubensdörffer, Galland, Mölders, and others were far from content. The losses, especially of the Stukas, were not encouraging, and the amount of confusion that had accompanied the day could not have sat well with the methodical and self-confident German military mind.

That night, bombing raids did some damage to a Spitfire "shadow" factory at Birmingham and destroyed some four-engine Stirling bombers. A bombing raid by the British Bomber Command crossed the Alps to bomb the Fiat and Caproni aircraft factories at Milan and Turin, causing much outcry.

In retrospect, the vaunted Eagle Day came and went without decisive results. It was more like the attack of a gaggle of crows than of the much-feared and respected German eagle. If a winner had to be determined, it was probably the British, for if German intelligence had been more accurate, and their raids better coordinated, they could have swooped down on England and caused much greater destruction. It was no walk in the park, but the RAF survived without serious losses.

BF 110 MISSION 5

Attack the Tangmere Airfield. Your mission is unescorted and many Spitfires stand in your way.

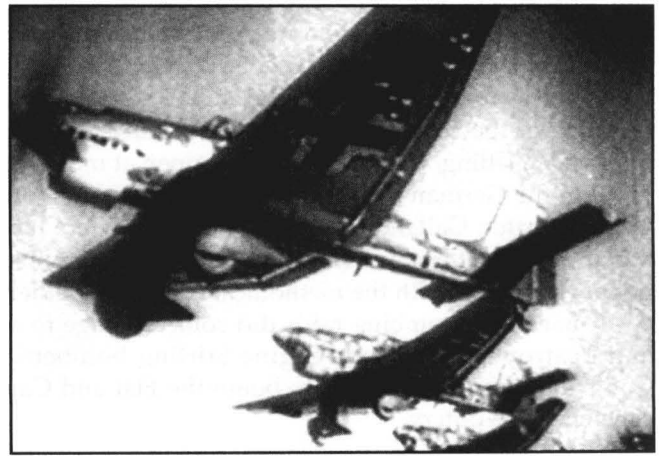
Strategy

As you approach the airfield from the Channel, one group of two Spitfires is approaching from the rear and another group of two Spitfires is approaching you from the front. Set your rear gunner to automatic and maintain your course for the target. Make slight adjustments in your course to bomb the large yellow hanger at the airfield. Your wingman will bomb the red hanger on the right. Use your dogfighting skills to combat the attacking Spitfires. Once your bombing mission is complete, head for home. Use your rear guns to take out any remaining Spitfires that are following you home.

JU 87 MISSION 4

As part of the great Luftwaffe attack on *Adlertag*, dive bomb the forward airfield at Detling.

Strategy



As you start this mission, you are following two other Stukas heading directly to the Detling Airfield SW of you. Two groups of Spitfires are in the air. One is attacking your forward group; the other will be attacking you. Maintain your course heading, and jump in the rear gunner seat and take care of the Spitfire that will inevitably be on your tail. As you get closer to the target, switch the rear gunner on auto, and use the pan mode to see if any course corrections are necessary. If you

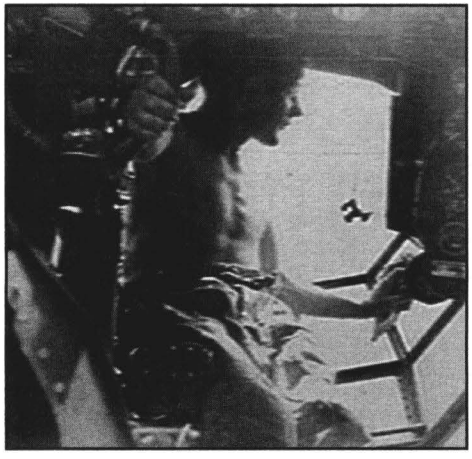
haven't made any changes in your course since you started, none should be necessary. Once your angle to the target in pan mode reaches 70 degrees, apply your dive brakes and begin your dive. Line up your sight just beyond one of the buildings and when you reach 3,000 feet release your bombs. Rather than leveling off at 2,000 feet, adjust your dive angle to match the two Spitfires sitting on the field. Let loose with your machine guns while carefully watching your altitude. When you reach 1,000 feet, level off, disengage your dive brakes, throttle up to 100%, and circle around to take care of any remaining Spitfires left sitting on the field. Once the Spitfires on the field have been taken care of, head for the Channel and your home field. Climb to about 3,000 feet and use your in-flight map to get on the right course heading for your field. Turn on your auto pilot and man the rear gunner seat for the return trip home. Use the pan mode to find enemy fighters approaching you. The other two Stukas will bomb the remaining buildings if they have survived and are good enough. They will also tie up the Spitfires while you make it to the Channel.

DO 17 MISSION 4

In the opening attack of *Adlertag*, join the initial wave of Dorniers on their attack on the airfield at Eastchurch.

Strategy

In this low level mission, you are following two Do 17s in a bombing mission of the Eastchurch Airfield at 2,000 feet. Because of the low altitude, you'll need to line up your target fast to leave enough time to drop your bombs. As you follow the other bombers to the airfield, you'll want to turn on your auto gunners and jump back into the pilot's seat. As you begin, see the buildings of the airfield, line up the center bar of your windshield so that the it is directly in line with the red building on the left. You can use the auto pilot to help you center the aircraft. Once the buildings are in plain sight, jump to the bomber position. As soon as red building is in plain view start dropping one bomb every second. The other Do 17s should have hit the far yellow building so you can start your flight home. Back to the pilot's seat, and turn NE while increasing your RPMs to 100%. Start a gradual climb while you head for the Channel. Level off at about 12,000 feet while leaving the engines at 100% RPMs. The extra altitude can make the difference if you have to glide back to your airfield. The extra RPMs keep your speed up, making the Spitfire's chase you. Follow the English coastline, then turn ESE for home.



Inside the Do 17.

JU 88 MISSION 2

Attack the single most important aircraft factory in England—the Spitfire factory at Southhampton (which the Germans probably didn't actually know about).

Strategy

As you begin this mission, you are flying toward the factory at 10,000 feet, with the lead bomber ahead of you. You also have two Bf 109s escorting you. Turn on your auto gunners and use the pan mode from the pilot's position to see the target as it approaches. You'll start to see enemy fighters appearing on the horizon as you get close. As soon as the target is in view, switch to the bomber position. As the target appears on your sight, you'll notice that you are a few degrees off from dead center. Bank to the left by 2 degrees and then center the aircraft again. You should only have to make adjustments by a couple of degrees either way to line the target up on the center line of your target sight. Watch the bank angle indicator and use a light touch on the joystick to make these corrections. As soon as the target approaches the second ring from the center, begin to release one bomb per second. You should make at least two direct hits if the target is lined up properly. As soon as you release your bombs, jump back into the pilot's seat and take your plane out into the Channel by banking left to a course of about SSE. You'll have to man all of the gun positions, because you're going to encounter a whole slew of fighters on the way home! The main thing is to keep your altitude high and your RPMs up as much as possible. If you lose a lot of power, it is possible to do a slow descent to the French coastline and actually survive without bailing out, providing of course that your plane is not spinning out of control and you've survived long enough to make it close enough to the coastline.

August 14, 1940

Weather: Intermittent Clouds
Official Losses: Luftwaffe—19; RAF—8

After the intense activity of the previous day, it was a relief to the tired British pilots that the day began grey and unfit for air battles. Once again, the weather experts had failed the Luftwaffe and the "three or four days of clear weather" did not appear. The British were able to get some much-needed rest in the morning. However, the day was not uneventful.

Around midday radar blips appeared over Pas de Calais, and Air Marshal Park scrambled 40 fighters to intercept them. After some evasive flying, the force finally headed for Dover and was met by the RAF. In the ensuing battle, several planes were downed and two pilots killed. Only two Me 109s were shot down.

Manston got blasted another time. Rubensdörffer led his *Jabos* once more over this hapless airfield. At least two Me 110s were shot down by ground fire, but they succeeded in adding to the destruction of the field, destroying four hangars.

At the same time, at Lympne, the Inspector General had arrived as promised, handed out commendations, and ordered increased defenses and manpower for the airfield. This time he was spared by the Luftwaffe, however.

Elsewhere, Kesselring sent many small raids over England in order to harass the British fighter in preparation for a big day the next day. Middle Wallop, one of the prime targets of the previous day which had been missed in the clouds and confusion, was finally hit, though some of the raiders were also shot down by fighter defenses.

Dowding had reason to believe that the next day would witness a heavy German attack, and so he moved some of his more weary squadrons up north while replacing them with experienced, but more rested forces.

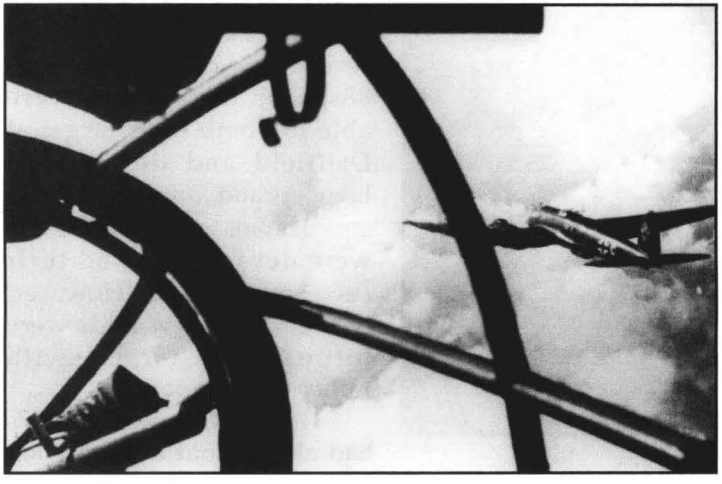
August 15, 1940

Weather: Clear

Official Losses: Luftwaffe—75; RAF—34

As this day dawned, few could have anticipated how important it was to be in the outcome of the Battle. Certainly not Göring. Once again, the disorganization of the Luftwaffe caused this day to begin on a confusing note. Expecting bad weather again, Göring delayed operations for the day and called a meeting of his High Command at Karinhall to examine the events of *Adlertag*. Meanwhile, the weather cleared up and Oberst Paul Diechmann, who was second in command at the Fliegerkorps II, decided to launch an attack that had been originally scheduled for that day.

This decision affected many other units which now mobilized their attacks while Göring entertained his cronies at his estate. Even the frantic call of Kesselring's Operations Officer, Major Hans-Joergen Rieckhoff, failed to get through the standing order that they were not to be disturbed, and the High Command were unaware that the heaviest day of fighting of the Battle was under way.



Up until now the north of England had been ignored. Due in part to the range limitations of the two-engine bombers and the fighters (particularly the Me 109s), the most reachable targets had all been in the south. Up to now Stumpf's Luftflotte 5 had not seen any significant action over England other than their regular reconnaissance flights.

The northern raids, initiated by Diechmann's decision, started out with more of the same

problems that had plagued the Germans so far. A diversionary group of Heinkel seaplanes had been sent out to occupy the British defenders' attention while the real bomber force, 70 He 111s and 21 Me 110s, headed for critical airfields from their bases in Denmark. Equipped with added fuel tanks for the long flight, according to some sources the Me 110s had even left their rear gunners behind to save weight. At any rate, the German commanders hardly expected to encounter much opposition in the north. Their estimates of RAF strength convinced them that the north was virtually undefended. This opinion was repeated by Dowding himself in a communique which stated: "The sustained resistance which [the Luftwaffe] was meeting in south-east England probably led them to believe that fighter squadrons had been withdrawn, wholly or in part, from the north in order to meet the attack...."

He 111 dropping its load.

Meanwhile, the real bomber armada, due to a navigational error, found themselves flying very close to the diversion aircraft, and so the RAF was in a perfect position to attack. According to reports, the first on the scene to confront nearly 100 enemy aircraft was a single squadron of 12 Hurricanes led by Ted Graham, a stutterer, whose reply to the question, "Have you seen them?" was to become famous: "Of course I've seen the b-b-bastards. I'm trying to w-w-work out wh-wh-what to do."

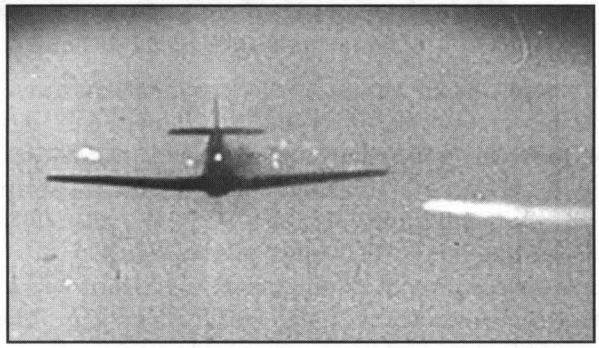
Splitting into two groups, one group attacked the Me 110s while the other concentrated on the bombers. However, once the real strength of the force had been determined, three more squadrons were scrambled and, in the end, the Germans lost at least 15 aircraft to only one for the RAF.

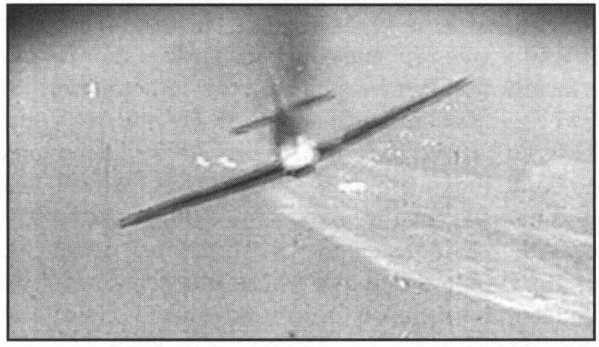
Around noon that same day, 616 Squadron was scrambled suddenly. Anxious to get back to the south where the action was, they were pleasantly surprised to be in the air after an unknown force. Along with half a dozen Hurricanes from 73 Squadron, they flew head-on into a force of 60 Ju 88s. They shot down seven of the raiders, but the Ju 88s, with their speed, were able to bomb their target at Driffield and destroy ten bombers and four hangars.

Scramble for the Hurricanes.

The losses to Luftflotte 5 were devastating, and their successes marginal. However, in the south, new raids were hitting their targets with rather more success.

Two large forces of Ju 87s had also set out around noon





to hit some of the targets they had hit before. At Hawkinge the defenders were ready and were able to shoot down two Stukas and damage several others, but the ample Me 109 support forces caught up with the Hurricanes and downed four of them. None of the pilots were lost, however.

Elsewhere, the defense was less prepared and at Lympne and Manston there were repeats of the previous days' performances. And in Lympne, almost as a ritual, came Sir Edgar Ludlow-Hewitt as the dust was still settling. He inspected the fresh craters and ordered them to be filled in.

Later, around 3 P.M., Hauptmann Walter Rubensdörffer must have been getting used to blasting the English airfields. After hitting Manston, he led his crack Me 110s and 109s against targets at Martlesham Heath north of the Thames Estuary, and with superb accuracy, all the bombs hit their targets. The destruction was widespread; fortunately, only two of the ground crew were injured seriously.

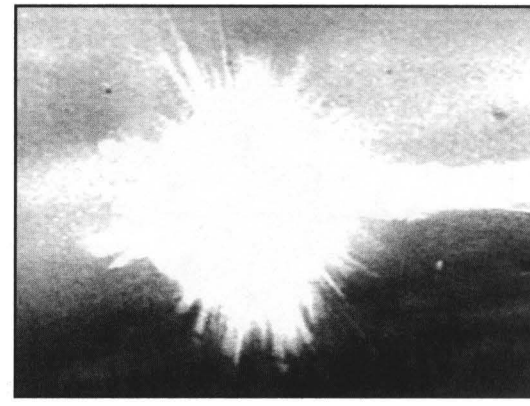
Already, this had been a heavy day, but the action was far from over. New plots were seen, big ones, forming over Normandy and around the Cherbourg Peninsula. With an estimated 300 attacking aircraft coming at them, the operations rooms at 10 and 11 Groups scrambled the most fighters yet. Approximately 150 Hurricanes and Spitfires were prepared to meet this attack which was expected to fall once again on the targets around Portland, Weymouth, and Southampton.

Heavy dogfights erupted over the Channel. Small groups of RAF fighters would intercept huge formations and go at them head-on to break them up. Several pilots were shot down in the heavy action, but, even though many bombers necessarily got through the defenses, the damage they did was negligible.

Meanwhile, another large force of 90 Dorniers were headed toward Eastchurch and Rochester escorted by about 130 Me 109s. Against overwhelming odds, Squadron Nos. 64, 11, and 151 attempted to break up the attacks, but were not able to do much damage and lost several

planes in the process. The bombers hit their targets—Short Brothers and Pobjoy aircraft factories—with accurate bombing. However, despite having set back the bomber production at Short Brothers, they did not damage their main targets—the Spitfire and Hurricane factories.

Finally, late in the day (after 6 P.M.), a final attack was mounted. The main targets of these late attacks were Biggin Hill and Kenley. Escorted by Me 109s with "free chase" orders, a large formation of Dorniers flew over Biggin Hill while once again Rubensdörffer led his Erpro 210 against Kenley.



When your luck runs out.

Although the expected fighter cover for the *Jabo* unit failed to appear, Rubensdörffer went ahead with his plans, flying low over the English countryside, buzzing quaint villages, livestock, and railway lines. He had decided to pass over Kenley and return to take it from the north, thus making his escape all the easier and misleading those on the ground as to his target. Just as his group were dropping their bombs, however, they were set upon by Hurricanes from the very experienced 111 Squadron led by John Thompson. Although they did some serious damage to the airfield (which turned out not to be Kenley after all, but Croydon), many of their bombs fell on residential areas, killing about 70, mostly non-combatants.

But Rubensdörffer's luck had run out. After a string of phenomenal successes, he had, perhaps, taken one risk too many. At any rate, the Hurricanes set upon the *Jabos* and shot down one Me 109 as the rest made their escape (certainly low on fuel by this time). Meanwhile, the less agile Me 110s formed a defensive circle and attempted to make individual dashes for freedom. John Thompson himself chased one of the 110s in a tree-top hugging race so low that he even saw his tracer knocking tiles off the roof of a farmhouse. But he also saw the 110 crash into the ground and virtually disintegrate. The pilot had been Rubensdörffer himself. He and his gunner were killed. In addition, five of the original 15 Me 110s failed to return. Erpro 210 was decimated.

To make matters worse, the Dorniers sent to bomb Biggin Hill missed their targets as well. In all, it was not a good day for the Luftwaffe. Although both sides vastly overestimated their successes of the day (some British claiming 182 victories while the Germans claimed 101), the real results were severe enough. Not only had they lost 75 planes, the Germans had also lost several senior officers in the fighting. Against that, the RAF had lost 30 fighters (plus some on the ground) and 13 pilots.

August 15, 1950 became known to the Luftwaffe as *der schwarze Donnerstag* or Black Thursday. Not only had their losses been disproportionate with their successes, but they had blundered in too many ways to count. Hitler was furious that Croydon (which was considered within London's proscribed area) had been bombed, and there was great concern. Meanwhile, Churchill, who had visited Dowding at Fighter Command toward the end of the day expressed nothing but admiration:

"The foresight of Air Marshall Dowding in his direction of the Fighter Command deserves high praise, and even more remarkable had been the restraint and the exact measurement of formidable stresses which had reserved a fighter force in the North through all these long weeks of mortal conflict in the South. We must regard the generalship here shown as an example of genius in the art of war."

Meanwhile, an article in the *New York Times* by Major Alexander Seversky stated the situation and perhaps changed many Americans' understanding of what was really happening:

"The action now being reported is generally regarded as the 'prelude' to an invasion. . . . But it is nothing of the sort. What we are now watching is the authentic big push. If Great Britain loses the present battle, she will in effect have lost the war, at least as far as the mother country is concerned. Whether the victors then decide to 'invade' the island or prefer to lay it waste systematically from the air without anything more than a token occupation of a few spots will be a matter of detail, without essential military significance." Seversky went on to warn America that they must learn a lesson from these events. The assumption that the British would not have been able to repel an invasion from across the Channel is not necessarily true, but it was the opinion shared by many at the time.

For instance, U.S. Ambassador Joseph P. Kennedy was still expressing extreme pessimism about Britain's chances and was advising Americans to pack up and go home while he moved his embassy and staff out of London. Needless to say, this attitude was not appreciated by the determined Brits, including Churchill.

SPITFIRE MISSION 4

Several Ju 88 medium bombers attack the Middle Wallop Airfield as you sit on the runway.

Historical Engagement

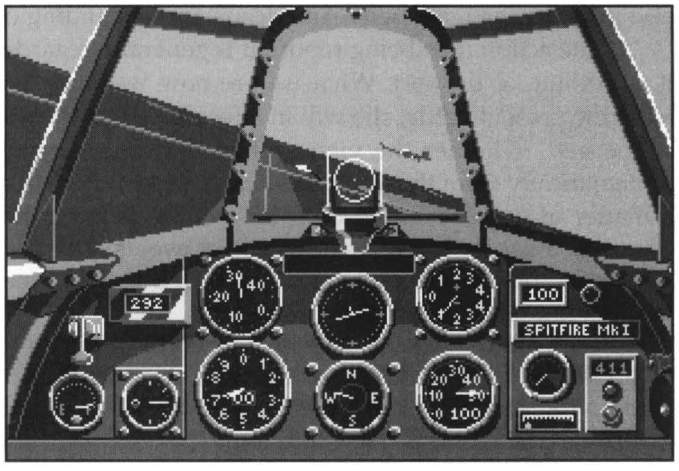
On August 15th, 1940, a group of JU 88s from I/LG 1 used a low level approach to attack the airfield at Middle Wallop. They arrived so unexpectedly, that they surprised and all but wiped out two British squadrons on the ground. Only a few Spitfires of the 609 Squadron managed to make it airborne while bombs were exploding behind them in the hangars.

Get your Spitfire airborne as quickly as possible as there are several groups of Ju 88s about to attack your airfield.

Initial Aircraft Positions

You are sitting on the ground at Middle Wallop Airfield.
Your wingman is at 1,000 feet 4 miles SW of you heading SSE.
1 Bf 109 is NNW of you at 1,000 feet heading SSE at 5 miles.
1 Ju 88 is East of you at 6 miles heading West at 1,000 feet.
1 Ju 88 is SSE of you at 10 miles heading NNW at 1,000 feet.
1 Ju 88 is SSW of you at 15 miles heading NNE at 2,000 feet.

Strategy



Try to get the bomber to turn back before bombing.

Take off from the airfield at 100% power and continue your course East. The first attacking bomber is directly in front of you. Conserve your ammo and wait until you can see sufficient detail in the bomber before you start shooting. You won't take the bomber out on the first run, so make a hard left bank turn and bring your plane to a westerly course. The bomber will be reducing its altitude to make its bombing run and will be directly in front of you. By this time the Bf 109 that was originally NNW of you will be in your area. Forget about the Bf 109, and concentrate on the Ju 88. If you are unsuccessful at destroying the Ju 88 before it unloads its bombs, move on to the Bf 109 and destroy it. You should have a couple of minutes to take it out before the next bomber comes in range.

When the next bomber comes, it will have a tight Bf 109 escort. Use the same tactics as you did on the first bomber. Again, don't worry about the Bf 109 until you either destroy the bomber before it drops its bombs or the bomber drops its bombs and heads for home. If you have a good wingman, he may have taken the last or second to last bomber out for you. If he hasn't, then the last bomber will be coming at you from the same general direction as the first two. It has a loose Bf 109 escort, so if you take out the bomber, save a few bullets for the pesty fighter that shows up a few minutes later.

Bomber attack tactics: Move from side to side so the gunners don't get a good fix on you. Attacking from above or below will yield the best results; however it's difficult to get set up in this position without wasting time.

In this mission the primary importance is the bombers. The sequence of attack should be bombers first, fighters second, even if it means risking damage to your aircraft.

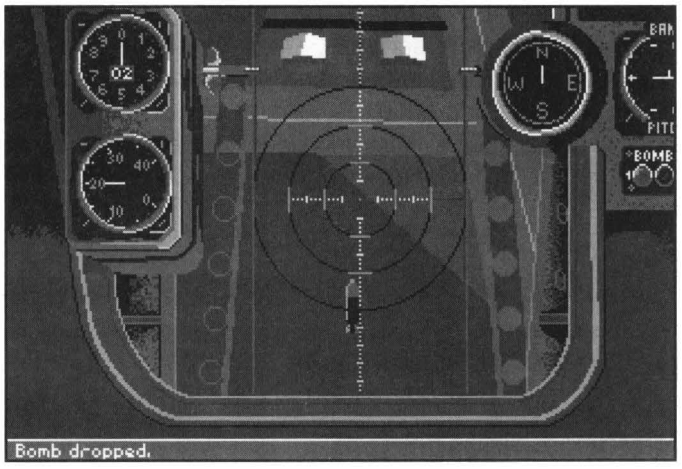
JU 88 MISSION 4

Using a low level bombing approach attack the Middle Wallop sector airfield in the western-most part of 11 Group.

Cross Reference: Spitfire Mission 4

Strategy

In this low level mission, you are following two Ju 88s in a bombing mission against the sector airfield at Middle Wallop at 2,000 feet. Because of the low altitude, you'll need to



line up your target fast to give you enough time to drop your bombs. As you follow the other bombers to the airfield, you'll want to turn on your auto gunners and jump back into the pilot's seat. As you begin to see the buildings of the airfield, line up the center bar of your windshield so that the it is directly in line with the yellow building. You can use the auto pilot to help you center the aircraft. Once the buildings are in plain sight, jump to the bomber position. As soon as red buildings are in plain view start dropping one bomb every second, up to three bombs. One of the three bombs should hit the yellow building. Continue to fly North for about 1 minute. Now turn West and fly in that direction one minute. Using the pan mode, you should be flying parallel with one of the enemy runways. Now turn South for one minute, or until you almost reach the end of the enemy runway. Now turn East, and you should see the buildings once again. Line up the center bar with the two red buildings. When they are in plain sight jump to the bomber position. As soon as one building appears, drop one bomb every second, up to two. Wait until you see the next building just appear, then drop the last bomb. With any luck, you should hit both buildings.

Back to the pilot's seat, turn South while increasing your RPMs to 100%. Start a gradual climb while you head for the Channel. Level off at about 12,000 feet while leaving the engines at 100% RPMs. The extra altitude can make the difference if you have to glide back to your airfield. The extra RPMs keep your speed up, making the Spitfire's chase you. Surviving this mission is hard because of the number of Spitfires you engage. Most likely the other bombers will be destroyed by the time you make it to mid-Channel. Though you increase your risk of getting shot down when making the second run at the airfield, you also increase your score. And since you'll probably get shot down anyway, regardless of whether you make the second run or not, you might as well go for the high score!

HE 111 MISSION 4

Avoid the attacking Spitfires to bomb the sector airfield at Middle Wallop.

Cross Reference: Spitfire Mission 4 (possibly)

Strategy

Immediately turn on your auto gunners and follow your flight leader to the target airfield. As you approach the target, switch to the bomber position—as soon as you reach the

edge of the first runway. Since this is a low altitude run, you're going to need to make any course adjustment early on. Once you have one or two buildings aligned with the center line, get ready to release bombs when the first building reaches the outermost range circle. The Spitfire action is furious so you'll only get one chance at the airfield. So make it count. Once you've released your bombs, turn south and head for home at full throttle. Once you're well over the Channel, or you reach 1/2 tank of gas, throttle back to 75%.

SPITFIRE MISSION 6

Intercept and destroy several waves of Stuka dive bombers as they attempt to obliterate two Fighter Command airfields.

Historical Engagement

On August 15, 1940, Alan Deere of the 54 Squadron based at Manston was on patrol above Hawkinge and Lympne. These airfields were attacked by many waves of Stuka dive bombers escorted by Bf 109s. Despite a good showing by Deere's squadron, the Stukas heavily damaged both airfields with precise bombing attacks.

As a member of the 54 Squadron, fly your Spitfire to intercept the Stukas before they can damage the vital airfields. Your plane is positioned between the attacking planes and their targets. Intercept those groups of Stukas that are closest to dropping their warheads.

Initial Air positions

You and your escort are on patrol at 10,000 feet.
3 Ju 87s are South of you at 8,000 feet heading NNW at 5 miles.
2 Bf 109s are SSE of you at 12,000 feet heading WNW at 10 miles.
3 Ju 87s are SE of you at 9,000 feet heading NW at 15 miles.
3 Ju 87s are SSE of you at 11,000 feet heading NNW at 22 miles.

Strategy

First go for the wave of Stukas south of you. The priority in this mission is the Stukas. The second wave of Stukas is close behind, so your first run at the initial wave has to count. The second part of the first wave has a Bf 109 escort. As the Bf 109s engage you and your escort, try to evade them and concentrate on the Stukas.

The second wave attacks the Hawkinge 11 Group Airfield. Make sure you're accurate and close enough to make every shot count. The Bf 109s will try to draw your fire as you go after the second wave to the north. Again, use evasive maneuvers while moving north for the second wave. As you're engaging the second wave, a fourth wave appears over France. Its target is the Hawkinge Airfield. Move south to intercept the third wave, then move north again to take out the fourth and final wave. If you're running low on bullets, take out the Bf 109s. The Stukas will not stay in the area after a bombing run, but

the Bf 109s will stick around until they finish you off. This way, you will be able to complete the mission rather than bailing out should you run out of bullets.

JU 87 MISSION 2

Dive bomb the forward airfield at Lympne while under fire from the Spitfires of the 54 Squadron.

Cross reference: Spitfire mission 6.

Strategy

When you start this mission, you and your flight leader are flying directly to the target from the Channel at 10,000 feet. As you approach the coastline you and your flight leader will encounter 2 Spitfires. Your flight leader will break off his attack run to engage the fighters. Don't follow him. Continue your course to the target, which is the primary objective. Use your pan mode as previously described, until you reach about 65 degrees to the first building on the right side. This is the easiest building to bomb since your course will take you dead center over this target. Engage your dive brakes and begin your descent lining your crosshair just slightly beyond the target. Release your bombs at 3,000 feet and pull up at 2,000 feet, releasing your dive brakes, and increasing your throttle to 100%. Bank right and begin a gradual climb.

Maintain a course heading of East. More Spitfires will engage you now. Hopefully your flight leader will have taken care of a few before he was shot down. (He always gets shot down for some reason.) As you ahead out into the Channel, you can level off at about 4,000 feet and put your plane on auto pilot. Now you can man the rear gunner seat. There should be about 3-4 Spitfires hot on your tail. If you're good (and lucky) enough to take them all out, get ready to meet the second wave of 3 Spitfires waiting to jump you as you reach the French coastline. If you're looking for a high score in this mission, you'll need to take out all the Spitfires and land your plane at the home field. If you're just looking to survive you can quit when the program prompts you to land or press Q to quit. You'll still get a decent score (maybe even a promotion!)

HURRICANE MISSION 6

A *staffel* of Bf 110s has targeted your home airfield for destruction. Intercept them in the Thames Estuary.

Historical Engagement

On August 15, 1940, as a part of the German effort to destroy all Fighter Command airfields, Bf 110s of the elite and experimental Gruppe 210 bombed the airfield at

Martlesham Heath. Heavy damage was done to hangars and communication buildings. The Hurricanes of 17 Squadron whose base had been attacked intercepted the planes after the damage had been done.

You are on patrol in your Hurricane above the Thames Estuary. Bf 110s are attacking your home airfield to the North. Head east, and don't let any of the bombers reach your base.

Initial Air Positions

You and your fighter leader are on patrol at 4,000 feet over the Thames Estuary.
2 Bf 110s are at 1,000 feet heading SSW 5 miles North of you.
2 Bf 110s are at 3,000 feet heading North 6 miles ESE of you.
2 Bf 110s are at 1,000 feet heading North 12 miles SE of you.
2 Bf 110s are at 1,000 feet heading NNW 20 miles SSE of you.
2 Bf 110s are at 2,000 feet heading NNW 28 miles SSE of you.

Strategy

The 2 Bf 110s closest to you (to the North) are not bombers. They are there to provide fighter cover for the remaining Bf 110s, which are carrying bombs. Head ESE and take on the first group of bombers. Once the action heats up, you'll need to refer to the Inflight map quite often to make sure you're going after the bombers and not the fighters. The successive waves are close together and come in twos. With the rear gunner firing away at you, you'll need to consider some alternate approaches to the aircraft. A head-on approach is good, as well as diving attack from above. It takes only a few good shots to inflict heavy damage on the Bf 110. Make your shots count, and stay away from the tail gunners!

BF 109 MISSION 7

Escort Stuka dive bombers during their attack on two Fighter Command airfields.

Strategy

As the mission begins, you will be flying escort to two groups of Stukas whose targets are the Lympne 11 Group Satellite Airfield and Hawkinge 11 Group Satellite Airfield. As you approach the coast of England, two groups of fighters will approach you head-on. One will approach slightly from the North and the other from the SW. The group from the SW will be closer, so attack this group first. Your shots must be accurate because as you engage this group the second group is already attacking the Stukas to the North and needs your assistance. Destroy the first group as quickly as you can, and move north to engage the second group of fighters.

Once the Stukas begin their bombing raid, more fighters will appear from the North and South. Use your ammo sparingly, and try to make your shots count. Otherwise, you'll run out of ammo and losses among the Stukas will be high (and your score low).

BF 110 MISSION 2

In a face off between the RAF's Hurricane and the Luftwaffe's Bf-110, protect your leader in a fierce free chasing dogfight.

Strategy

Basic dogfighting skills.

BF 110 MISSION 6

Bomb the airfield at Kenley and face fierce fighter attacks during your dash to the coast.

Strategy

In this mission, you are approaching the target airfield from the west. One group of two Hurricanes is approaching you from the east. Set your rear gunner to automatic and maintain your course for the target. As you approach the target, make slight course adjustment to line up on the first red hanger on the right. Your wingman will bomb the large yellow hanger on the left. After you drop your bombs, fight your way to the coast as groups of Hurricanes approach you from all directions. Once you're near the coast, you can dogfight the Hurricanes. If you get severely damaged, head for the Channel, and if possible, home.

DO 17 MISSION 3

Bomb the aircraft factories at Rochester in an attempt to disrupt production of Stirling bombers. (The Germans may not actually have known that these bombers were being built there.)

Strategy

As you begin this mission, you are flying toward the factory, at 2,000 feet, with the lead bomber ahead of you. Turn on your auto gunners and use the pan mode from the pilot's position to see the target as it approaches. You'll start to see enemy fighters appearing on the horizon as you get close. Make sure you're lined up dead center with the target as you approach. As soon as the target is in view, switch to the bomber position. As the red building in the center of the target appears in your sight, drop two bombs and jump back into the pilot's position. Bank right and head north to the second target. The lead bomber

should be ahead of you on the same course. Line up the second target as you did the first, and jump into the bomber's position to drop the remaining two bombs on the target as you did the first. As soon as you release your bombs, jump back into the pilot's seat and take your plane out into the Channel by banking left to a course of about ESE. You'll have to man all of the gun positions, because you're going to encounter a whole slew of fighters on the way home! The main thing is to keep your altitude high and your RPMs up as much as possible.

August 16, 1940

Weather: Clear

Official Losses: Luftwaffe—45; RAF—21

Despite the losses of Black Thursday, Göring stuck to his strategy of knocking out the forward RAF airfields. Consequently, the English skies were once again filled with Luftwaffe raiders for most of the day. Where the Germans had flown 1,786 sorties the previous day, this day they flew another 1700. Many of the attacks started as large formations of bombers, but split up as they crossed over into England to attack separate targets. And, although the scattered cloud cover helped to obscure some of the main airfields from the Germans' view, it also made it nearly impossible for the Observer Corps to deliver coherent reports of enemy movement.

Among the targets bombed heavily that day were Ventnor (just operational again, and this time knocked out for seven more days) and Tangmere Airfield. One of the Luftwaffe's slickest raids involved two Ju 88s that came in to a training field at Brize Norton (near Oxford) with wheels down, hoping to be mistaken for returning Blenheims. The tactic worked as they laid their bombs perfectly, destroying 46 planes and damaging 11 Hurricanes before making their uncontested escape.

Fighter Command lost some outstanding pilots that day, including the American ace, Billy Fiske. This was also the day of Flight Lieutenant James Nicolson's heroic attack in a burning plane and subsequent parachute drop through friendly ground fire, which made him the only World War II fighter pilot to earn the Victoria Cross. Although the Luftwaffe losses were greater than those of the RAF, and they were suffering significantly, the slow, steady attrition was thinning out the British strength. Too many experienced pilots were

being lost and their replacements, many of whom might boast no more than eleven days' training and perhaps nine hours flight experience, would be like so many shooting gallery targets if they could not get some additional training before engaging in high-speed dogfights against an experienced enemy.

Some good luck still accompanied the British, however. Hough and Richards tell of a fortuitous slip-up in security: "The German intelligence about the function of enemy airfields was further confounded by a grave slip, but a providential one, in British security. Sub-Lieutenant Greenshields of 266 Squadron had taken off with an unposted letter to his parents in his pocket. In it he described how his squadron had been bombed at Eastchurch. In fact, they had made only a brief landing at this Coastal Command station. But when this letter was discovered in the dead pilot's pocket when he was dragged from the Channel, it provided the confirmation the German intelligence needed that it was, in fact, a front-line fighter station. Many more tons of bombs were dropped, and wasted, on this hapless airfield as a result."

JU 87 MISSION 5

Knock out the Ventnor Chain Home radar station. Beware of the defending Spitfires.

Strategy

Maintain your start heading and follow the flight leader to the target. Turn on the auto rear gunner. The accompanying Bf 109s will provide some cover while you make your attack run. Use your pan mode to view the target and monitor the start of your dive bomb run. Your flight leader will bomb the red building on the left side of the radar station. Your target will be the yellow building on the North border. Once you begin your dive, line up the gun sight just beyond the yellow building. Release your bombs at 3,000 feet and pull out at 2,000 feet. Turn of your dive brakes, increase power to 100%, execute at 180 degree turn and climb to 2,000 feet. Try to dodge the bullets from the Spitfires as they attack, but continue to head for the Channel. Once you reach the Channel, turn on your auto pilot and man the rear gun. If you can take out the Spitfires on your tail, adjust course for your home field. Use the pan mode along with the rear gunner seat to take any remaining Spitfires.

View from a Stuka after bombing.

JU 87 MISSION 7

Join the attack on the sector airfield at Tangmere. Follow several other Stukas and bomb any remaining hangers.

Strategy

You begin this mission following your flight leader to the target at Tangmere. Set your auto pilot and jump in the rear gunner seat. A Hurricane is directly on your tail. Work on the Spitfire for as long as you can or until he's destroyed. You'll know it's time to jump in the pilot's seat and turn on the auto gunner when you can see the coastline from the rear gunner's window. Your flight leader is going for the small red building on the left. The easiest to line up on from this approach is the large yellow building on top. Using the pan mode watch the degrees to the target and begin your dive bomb attack at 70 degrees. Line up the sight just beyond the building. Release your bombs at 3,000 feet and pull up at 2,000 feet. Turn 180 degrees for the Channel. Once you have the plane heading in the right direction, turn on the auto pilot and man the rear gunner seat.

August 17, 1940

Weather: Clear
Official Losses: Luftwaffe—3; RAF—0

Although the weather remained clear, August 17 was a day on which both sides took a breather. As Mike Crossley, CO of 32 Squadron, wrote, "Not a single sausage, scare, flap or diversion of any description today. Amazing. Heavenly day, too."

Editorial Note: Although two missions from Their Finest Hour: The Battle of Britain *are attributed to August 17, they actually occurred on August 18. They are Hurricane Mission 1 and Ju 88 Mission 3. Consequently, their strategies are described in the next section.*

August 18, 1940

Weather: Clear, but worsening
Official Losses: Luftwaffe—71; RAF—27

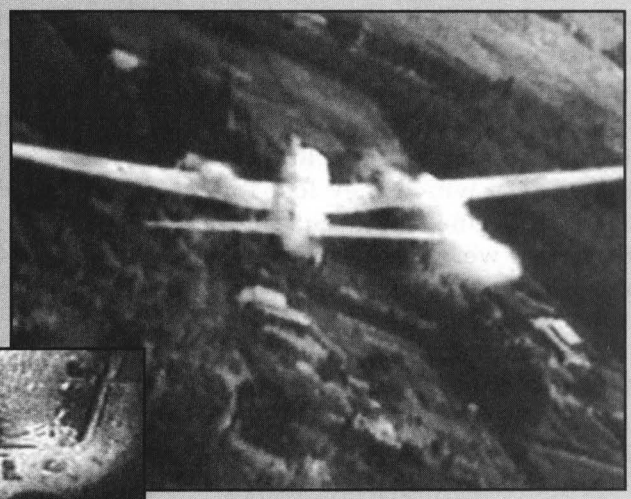
Nobody in England had quite expected the day off that they had just experienced, but nobody was complaining. Nobody was expecting the respite to last, either. Predictably, the Luftwaffe renewed its savage attacks on the British airfields on August 18.

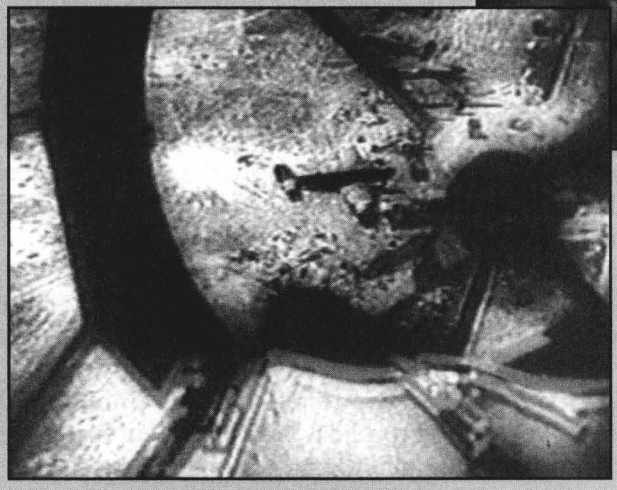
The first attacks were to be well-coordinated raids on Kenley and Biggin Hill. Instead of a lot of widespread actions, the Luftwaffe were going to concentrate on these targets and, presumably, wipe them out with a combination of high-altitude and low-flying attacks.

As usual, things didn't go exactly as planned, and the high-altitude He 111 bombers were late arriving at Kenley, so that Wilhelm Raab's wild, land-hugging flight of Dorniers arrived first. They delivered their bombs right on target, however, and caused a great deal of devastation.

However, the raiders were not to escape unscathed. Just as they approached the end of the airfield and were starting to climb away, a new defense suddenly sprang up in front of them.

"We zoomed over the English countryside, a few metres high. Every fold in the ground served as cover for us, each wood was exploited as a hiding place," wrote Rolf von Pebal. "We bounded over trees, undulating the whole time. A train rushed by underneath us. A couple of cyclists dashed for cover in the ditch by the side of the road."





On the deck.

Unteroffizier Schumacher, on the right of the formation, watched fascinated as the bombs from the leading aircraft rammed into the hangars. "Other bombs were bouncing down the runway like rubber balls. Hell was let loose. Then the bombs began their work of destruction. Three hangars collapsed like matchwood. Explosion followed explosion, flames leapt into the sky," he later wrote. "It seemed as if my aircraft was grabbed by some giant. Bits of metal and stones clattered against the fuselage; something thudded into my back armour and splinters of glass flew. There was a smell of phosphorus and smouldering cables."

This was the cable and parachute defense. Raab himself describes it thus: "Suddenly red-glowing balls rose up from the ground in front of me. Each one trailed a line of smoke about 1 metre thick, with intervals of 10 to 15 metres between each. I had experienced machine-gun and flak fire often enough, but this was something entirely new."

Raab was lucky, or skillful. At any rate, he slewed his Dornier into a steep bank, and, although caught by the steel cables that had shot up into the air, his plane was damaged, but managed to slip out of the cables' grip. Not so lucky was Feldwebel Peterson whose Dornier was caught fully by two cables and turned downward to smash, full speed, into the ground, killing Peterson and his whole crew, including a high-ranking observer, Oberst Otto Sommer.

But the attack wasn't finished. The high-level bombers, better late than never, flew over minutes later and dropped their bombs, causing further destruction. However, these bombers

were attacked by Mike Crossley's 32 Squadron Spitfires, who managed to partially disrupt their attack, shooting down some of the bombers. Meanwhile, Hurricanes from 615 Squadron took on the Me 109s in a lopsided encounter in which they lost four planes and one pilot. Six more Hurricanes were destroyed on the ground. Amazingly, Kenley was back in service within an hour or two.

Squadron Leader Anthony Norman, Fighter Controller at Kenley: "We felt we had won a great victory—the Germans had obviously tried very hard to wreck Kenley but we had survived. And by the late afternoon we were back in business again. If one had spoken to anyone on Kenley that afternoon, one would have found them in the highest of spirits. Nobody in the front line worried too much about the wrecked hangars. Nor the wrecked aircraft; it was merely a case of asking for some more and they would arrive—and they did. So long as the people and the system survived, that was all that mattered. Equipment could be replaced and buildings could be repaired."

The scene at Kenley was largely repeated at Biggin Hill. The expected high-altitude bombers were once again late, and so the low attack went in first. These unlucky pilots and crew fared far worse than the Kenley raiders had done. Of nine Dorniers to fly the low-level attack, only two made it away safely. Two were hauled down by the cables and parachutes while the others were shot down by the defending forces.

Shortly after the first attack, as at Kenley, the high bomber force—comprised of some 60 He 111s, Me 109 escorts and some Ju 88s—made their bombing runs, but were harried by the fighters from 610 Squadron's Spitfires and 32 Squadron's Hurricanes. As a result, many of the bombers missed their targets.

There was plenty of other action during the day, however, despite the high priority of the attacks on Kenley and Biggin Hill. Oberleutnant Wolfgang Ewald, having carried out his support mission for some bombers, and having, for once, some extra fuel, decided to strafe the airfield at Manston before heading back over the Channel. His off-hand attack destroyed most of the planes of 266 Squadron, and it was only by some miracle that several pilots, caught completely by surprise, were not killed on the ground.

Over Ashford, a town growing familiar with the practically daily air battles overhead, Hurricanes of 56 Squadron set upon a defensive circle of five Me 110s and shot them all down.

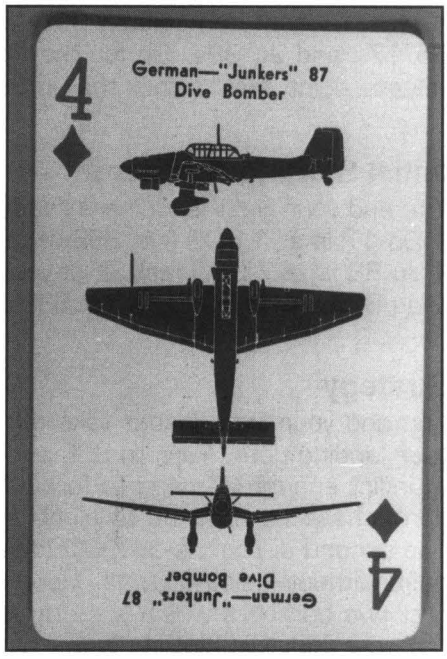
These raids, which took place around midday, were, as usual, only the prelude. By now, the RAF had lost 23 fighters (in the air and on the ground) and five pilots. The Luftwaffe, while it had only lost 20 airplanes, had probably lost as many as 70 pilots and crew. And there was more to come.

Once again lacking good intelligence information, the Germans fingered several airfields for destruction that did not belong to Fighter Command. Among them were Gosport and Ford, two naval air stations, and Thorney Island, a Coastal Command station. Consequently, they sent out a massive force of 111 Ju 87s with 50 or 60 Me 109s in support to attack these locations as well as the Poling radar station.

The RAF watched the approach of this raid with consternation and scrambled all available squadrons. Gosport was hit hard because there was no interference. Thorney Island, however was protected by 43 and 601 Squadrons and, while the Hurricanes went to work on the Stukas, the airfield escaped most of the probable damage it would have suffered.

Ford was completely unprepared and was badly damaged, but, again, none of these airfields were critical to Fighter Command, and therefore none were directly involved in the defense of the British Empire at this critical time. However, the attack on Poling was also effective, as 90 bombs were dropped on it. This was a serious blow, with Ventnor still out of action, and Poling, though set up with emergency equipment, was to remain ineffective until the month's end. On the other hand, mobile radar stations on the Isle of Wight and near Poling were able to fill in any gaps, so the defense network was still operational.

However severe the price had been to the British, the Luftwaffe paid an even stiffer price. In one *gruppe* alone, 12 of 28 Stukas were shot down, and another six barely limped back to France. Of the raiding force, at least 30 Stukas were lost or heavily damaged. The Luftwaffe commanders had to admit that the Stuka could not survive long in the perilous environment created by the British defense system.



It wasn't in the cards for the Stuka.

Meanwhile, as they had on previous days, the Luftwaffe launched another attack late in the day. This time more than 100 Dorniers and Heinkels came flying toward Hornchurch and North Weald. Tired though they were, the Fighter Command pilots went up once again and plowed into the bomber formations. In combination with their daring head-on attacks, the weather had gotten worse, and as the day closed, many civilians were killed and wounded as the bombers jettisoned their bombs.

Some people refer to this as "the hardest day," and there's a great account of it in the book **The Hardest Day** by Alfred Price. It recounts the events of August 18 in great detail, from the perspective of pilots on both sides as well as from many non-combatants. It provides an excellent look at the events of this one day from several sides.

HURRICANE MISSION 1

Do 17 and Ju 88 bombers approach Biggin Hill at several altitudes. Take off and intercept them.

Historical Engagement

On August 17, 1940, Dover Chain Home reported the heaviest buildup of German forces yet seen in the battle. 11 Group brought every squadron to readiness. At about 13:00 Biggin Hill was attacked by Do 17s of the KG 76. They attacked at low level and were met by Hurricanes from 32 Squadron. Ju 88s arrived shortly afterwards dropping their bomb loads from high altitude. The airfield received only minor damage.

Take off immediately from Biggin Hill to thwart the multi-level bombing attack from Do 17s and Ju 88s. Go for the Do 17s which are closest to the airfield and their bomb release point. Next attack the Ju 88s approaching from higher altitude.

Initial Starting Positions

You and your flight leader are ready for take off at Biggin Hill.
1 Do 17 is at 1,000 feet SSE of you at 6 miles heading NNW.
1 Ju 88 is at 7,000 feet SE of you at 12 miles heading NNW.
2 Ju 88s are at 15,000 feet SSE of you at 18 miles heading NNW.

Strategy

You and your flight leader take off from Biggin Hill. Push your throttle to 100% and raise your landing gear. Turn to SSE and engage your first target, the Do 17 at 1,000 feet. Try to inflict enough damage to force the bomber to abort its attack run. After it passes you, don't chase it; continue to climb at the fastest rate possible without stalling the aircraft. The second aircraft is at 7,000 feet. Again, inflict as much damage as possible in a single pass without losing altitude. Hopefully, your flight leader will mop up and take care of the first two bombers which are crippled. His position is directly above the airfield throughout the scenario. His altitude is not high enough to engage the last two Ju 88s, so you must continue to climb to meet them at 15,000 feet. Though the Hurricane has more ammo than a Spitfire, you must conserve and make every shot count. You may want to consider inflicting enough damage on each bomber for an early release of its bombs and then mopping up with your remaining ammo.

JU 88 MISSION 3

Attack the sector airfield at Biggin Hill as Hurricanes intercept.

Cross Reference: Hurricane Mission 1

Strategy

In this coordinated effort, you must bomb the remaining buildings of the Biggin Hill Airfield. Two Do 17s approach at low altitude in front of you. First start this mission by turning on your automatic gunners. Hurricanes are closing fast behind you and are hell bent on intercepting you. Jump back in the pilot's seat and use the pan mode to spot the target directly in front of you as you approach it. Once the target is in sight turn on the automatic pilot, and move to the bomber's position. Through your gun sight you will notice that the Do 17s bomb the two smaller buildings nearest the runway. Your target will be to the right of these buildings, which is the large yellow building. You're going to have to make small corrections in your course to line up the center line of the gunsight with this yellow

line. The auto pilot will help you re-center the aircraft after you make corrections. Since you're so high up, you won't see the building until it just reaches the top of the outermost range circle. You may have to make rather quick corrections to keep the target lined up. Again, the auto pilot will help you re-center the aircraft after you make these corrections. Once the building reaches the second range circle from the center, let loose one bomb every second. You should score at least one direct hit with this method. Once you release your bombs, go back to the pilot's position, and turn left heading ESE. You should see the Do 17s ahead of you. Try to stay with them as they will provide cover fire and support for the return trip home. The gunner position you most want to cover on the way back is the center one. There will be a lot of hostile fighters on the way back, and you need to conserve ammo, especially in this position.

JU 87 MISSION 6

In the face of heavy fighter opposition, dive bomb the radar station at Poling.

Strategy

You're the flight leader as you approach the Poling radar station with another Stuka following in over the Channel. Heavy fighter opposition awaits you as you approach the coast. Your rear gunner skills will have to be good for this mission! Turn on your auto pilot and man the rear gun. Be careful not to shoot down the Stuka behind you! As you approach the radar station turn on your auto rear gunner and use your pan mode to line up your plane with the yellow building on the top of the installation. Begin your dive at 70 degrees lining up the gun sight just beyond the yellow building. After you drop your bombs, level off, release your drive brakes, and increase power to 100%. Execute a 180 degree turn and head for your home airfield. Because of all the damage your plane has probably received from the Hurricanes, don't attempt climbing to a higher altitude. This will slow your airplane down and make you an easier target for the attacking fighters. Try to maintain an altitude of at least 1,000 feet in case you have to maneuver, however.

> "Contrary to what some accounts have suggested, the dive bombers were not vulnerable to fighter attack during their dives; indeed, the only time the Junkers 87 was not vulnerable to fighter attack was during its dive. 'In the dive they were very difficult to hit, because in a fighter one's speed built up so rapidly that one went screaming past him,' remembered Flight Lieutenant Frank Carey who flew Hurricanes with No 43 Squadron from Tangmere. 'But he couldn't dive for ever...' At the bottom of the dive, after it had pulled out, climbing slowly away, the dive-bomber was extremely vulnerable. 'Stukas were my favourite opposition,' recalls Carey."

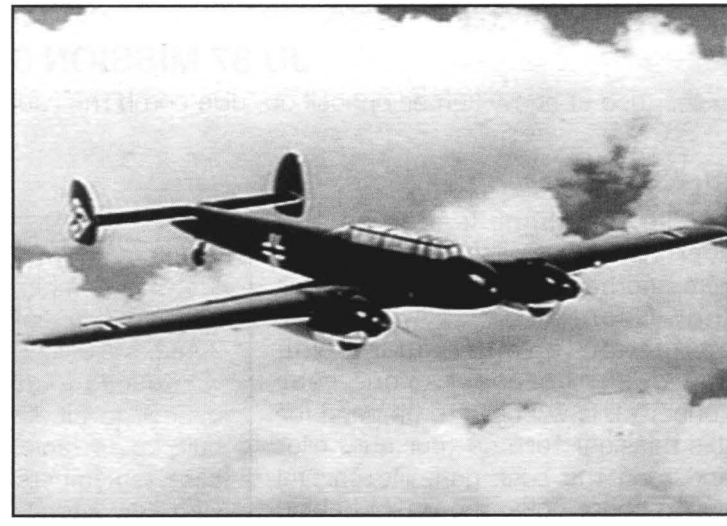
August 19, 1940

Weather: Cloudy

Official Losses: Luftwaffe—6; RAF—3

With weather conditions unfavorable, the Luftwaffe regrouped. Göring, after lambasting his pilots, made several changes. He assigned young fighter pilots like Galland and Mölders to head their own *Jagdgeschwader*, calling on them to be more aggressive, but at the same time hampering them by forcing them to fly close escort to the bombers (which meant that they sacrificed speed, and, more importantly, height). The fighter pilots were not pleased with these orders.

The Stukas were to be withdrawn from the front line of the battle. Their losses were unacceptable. The Me 110s, which had also suffered severe losses, were to fly in restricted missions—those beyond the range of the 109s, for instance—or they were to fly with 109 escorts. The proud *zerstoerer*, to paraphrase a statement by von Richthofen, had "had its feathers well and truly plucked."



Perhaps the most fortuitous decision to come out of Karinhall at the time was the decision not to attack the radar stations any further. Göring had judged that it did no good, and had decided to concentrate future efforts on the fighter force and the aircraft industry itself.

Meanwhile, Dowding had a tactical meeting as well. He identified the protection of the Fighter Command airbases to be of primary importance, and ordered that the fighters avoid fighter-to-fighter battles and concentrate on the bombers. Like Göring's orders, Dowding's did not always find favor among the pilots who wanted to mix it up with the German fighters.

The next few days, with weather unfavorable, saw a relative lull in the fighting. No massive bomber formations appeared, but there were several skirmishes. On the 19th, a flight of about a hundred 109s flew along the coast to try to provoke an RAF reaction, but there were ignored. Later, Ju 88s attacked Southampton and the Pembroke docks.

In all, when assessing the situation at the time, it was clear that the RAF was even more undermanned than it had been at the beginning of the Battle, and that reserves of airplanes were steadily thinning. Most people believed that if the Battle were to go on much longer at the present pace, it would not favor the Brits, despite the proportionately higher losses of the Germans. On the other hand, the Germans were taking a severe beating as well. At this point, several of the most active squadrons from the south were moved north for a rest.

August 20, 1940

Weather: Cloudy, unstable weather
Official Losses: Luftwaffe—7; RAF—2

With the weather too poor for any major missions, several smaller raids took place, especially at Manston and Martlesham. The fierce Polish 302 Squadron saw their first action, and shot down their first plane.

Winston Churchill delivered his famous speech in which he identified, for all time, The Few.

> **"The gratitude of every home in our island, in our Empire, and indeed throughout the world, except in the abodes of the guilty, goes out to the British airmen who, undaunted by odds, unwearied in their constant challenge and mortal danger, are turning the tide of the world war by their prowess and by their devotion. Never in the field of human conflict was so much owed by so many to so few."**

August 21, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—14; RAF—1

The action on the 21st was light, though there were some encounters, which favored the British by a wide margin.

August 22, 1940

Weather: Cloudy
Official Losses: Luftwaffe—3; RAF—5

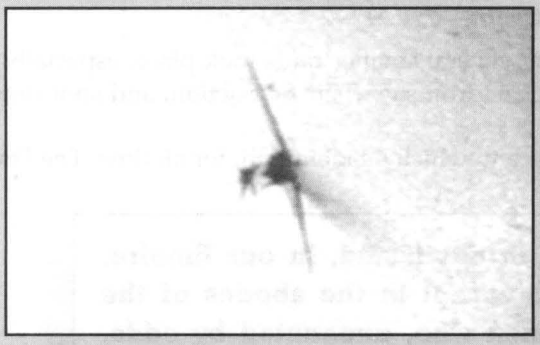
More scattered attacks, including some convoys and Manston... again. Night bombing missions began to increase, however, with several key targets attacked.

August 23, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—2; RAF—0

There was little activity during the day, and the night bombing continued.

Bailing Out



In a skirmish with some 109s, "Cocky" Dundas was shot down. "White smoke filled the cockpit and I couldn't see the sky or the Channel coast 12,000 feet below. Centrifugal force pressed me against the side of the cockpit and I knew I was spinning. I felt panic and terror and I thought 'Christ, this is the end!' 'Get out, you bloody fool; open the hood and get out.' I tugged the handle with both hands where the hood locked into the top of the windscreen. It moved back an inch, then jammed again."

After falling several thousand feet, "I pulled with all my might and at last it opened.' Dundas was able to get out, barely, and managed to reach the earth safely with splinter wounds and a dislocated shoulder while his Spitfire blasted into a field, scattering a herd of sheep. (Hough and Richard, **Battle of Britain**)

Chapter 6
The End of the Battle

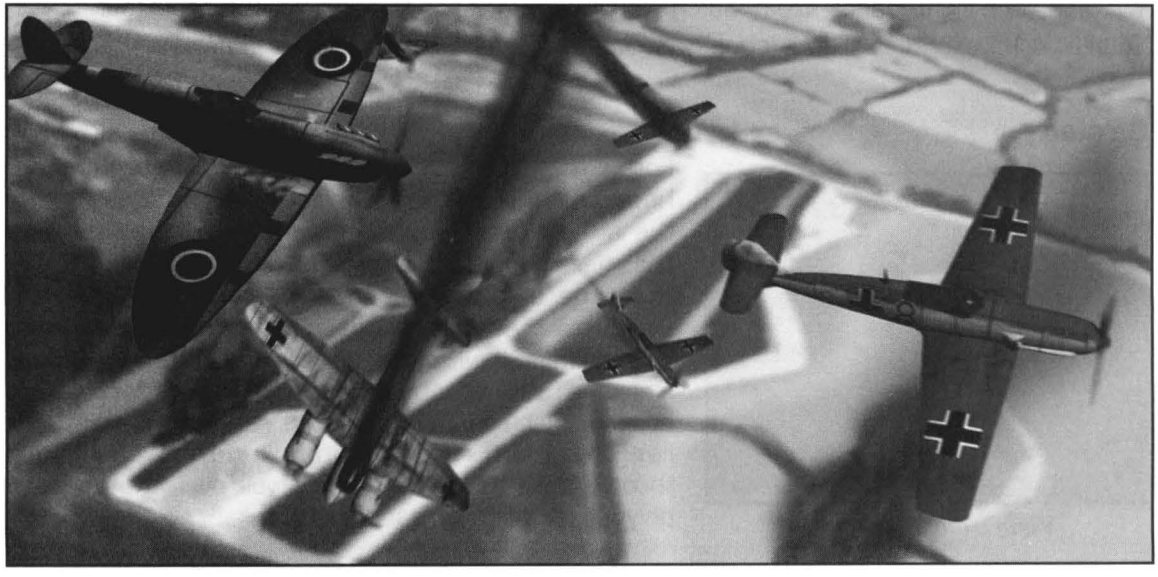
August 24, 1940

Weather: Clear

Official Losses: Luftwaffe—38; RAF—22

After the past few days, the 24th saw a renewal of the ferocious fighting as the weather cleared. This was the beginning of a new phase of the Battle, and the RAF airfields took a constant pounding during this period with losses mounting steadily.

In the early morning there was an attack on Great Yarmouth, followed later by attacks on Manston (as usual), North Weald, and Hornchurch. Park appealed to Leigh-Mallory for support from 12 Group, and some support arrived to help out, but, according to some reports, a three-squadron "big wing" took so long to form that much of the support failed to arrive. Leigh-Mallory claimed not to have been notified soon enough, and a smoldering fire flared up into a heated battle between Park and Leigh-Mallory.

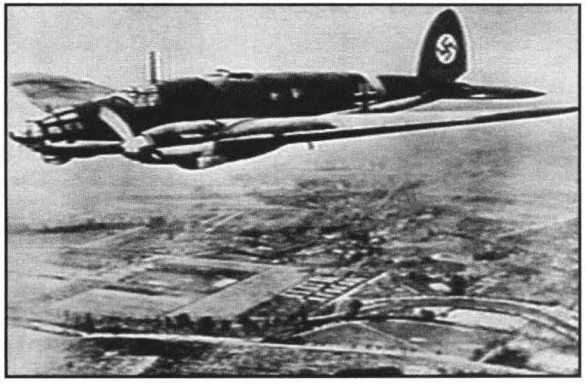


HE 111 MISSION 3

Join the bombing raid on North Weald as the focus of attacks is on Fighter Command's airfields.

Historical Engagement

Beginning on August 24, 1940, the Luftwaffe stepped up its attacks on Fighter Command airfields. During the period from August 24th to September 6th, the Luftwaffe's efforts almost succeeded in finishing off Fighter Command. As a part of this effort, a formation of He 111s raided the sector airfield at North Weald. The support of Bf 110s on escort fended off the intercepting Hurricanes of the 151 Squadron. The bombs fell squarely on the station's buildings causing considerable damage.



The He 111 on a bombing mission.

Fly a He 111 on the raid against North Weald on August 24. Follow your flight leader as he approaches from the Southeast. Watch out for Hurricanes that may break through the Bf 109 escort. Bomb the hangars and buildings from about 8,000 feet.

Starting Positions

You and your flight leader are heading Northwest towards the airfield at 8,000 feet. Your Bf 110 escort is slightly ahead, engaging 3 Hurricanes that are all around you.

Strategy

View from a Heinkels.

Follow the flight leader to the target. Make sure you have your automatic gunners on. Align the center of the airfield (where the two runways cross) between the main support beams of your wind screen. Once the edge of the first runway disappears from view switch to the bomber position. Try to align at least two buildings with the center line of your scope. Release one bomb every second once the first building just reaches the third range circle on your range scope. Turn for home and increase your throttle to 100% until you're well over the Channel or your fuel gauge reads 1/2 tank.

August 25, 1940

Weather: Clear, turning Cloudy
Official Losses: Luftwaffe—20; RAF—16

Among other action, a lone German bomber that lost its way dropped its load of bombs on the city of London. Although Hitler had still not lifted his order that London be off-limits, this bombing touched off the British reaction, and that night 81 RAF bombers hit Berlin in reprisal.

In other action, the Germans sent over bomber raids at Portland and Weymouth where they were met by concerted attacks from several RAF squadrons. Still, the lopsided losses that had previously favored the RAF were beginning to disappear. As experienced pilots were lost, and their green replacements entered the Battle, it was, perhaps, not surprising that the figures were becoming less favorable.

Famous photo of a Heinkels over the Thames.

There were still veterans among the RAF. Some, in fact, were to survive not only the Battle, but the war itself. But the continued losses were severe and the situation was not to get better for weeks.

August 26, 1940

Weather: Cloudy, but clearing
Official Losses: Luftwaffe—41; RAF—31

Early in the day a raid of Dorniers attacked Debden, and despite being attacked severely by a combination of RAF squadrons, some were able to drop their bombs with devastating effect. Seeing successful action for the first time was the Czech squadron No. 310, while the Canadian No. 1 Squadron was less fortunate, losing several planes and one pilot. 616 Squadron were bounced soon after taking off by 109s and lost seven planes, two pilots killed and four more wounded.

Later in the day, Sperrle sent 50 Heinkels with escort, but they were intercepted by three squadrons and failed in their mission against Portsmouth.

Len Deighton (Fighter) recounts another mission in which a force of Dorniers were met by fighters from Croydon. Their Me 109 escort gone (lack of fuel), the Dorniers became targets for the defenders. Deighton quotes Peter Townsend:

> "I brought the squadron around steadily on a wide turn moving it into echelon as we levelled out about two miles ahead on a collision course. Ease the throttle to reduce the closing speed—which anyway allowed only a few seconds' fire. Get a bead on them right away, hold it, and never mind the streams of tracer darting

> overhead. Just keep on pressing on the button until you think you're going to collide—the stick hard forward. Under the shock of negative G your stomach jumps into your mouth, dust and muck fly up from the cockpit floor into your eyes, and your head cracks on the roof as you break away below."

Deighton also reports that some of these bomber crew felt they were being used as decoys.

August 27, 1940

Weather: Cloudy and Rainy
Official Losses: Luftwaffe—9; RAF—1

The weather did not favor much action, and there were no major raids.

August 28, 1940

Weather: Clear (Clouds over water)
Official Losses: Luftwaffe—30; RAF—20

While Churchill toured the southeast, he was able to witness some of the air battles there. In particular Peter Townsend's 85 Squadron did very well, shooting down six 109s without a loss.

Attacks on the airfields continued with Eastchurch and Rochford being hit. German fighters flew by in attempts to engage the RAF. The last of the Defiants are finally pulled from the Battle after continual losses whenever they participated. German night attacks increase. German losses at night are negligible and the British have no solution in sight. The irony is not lost on Dowding that the more effective the day defense becomes the more likely the night missions will increase. With new guidance systems, the Germans are able to send their bombers very accurately to their targets.

August 29, 1940

Weather: Cloudy, but clearing
Official Losses: Luftwaffe—17; RAF—9

Massive fighter sweeps fail to rouse any response, and some in the Luftwaffe believe it is a sign that they have wiped out the RAF. Kesselring began to experiment with tactics that could bring the Fighter Command pilots out or catch them unprepared. For instance, he would vary the timing of raids to catch the RAF pilots in the act of refueling.

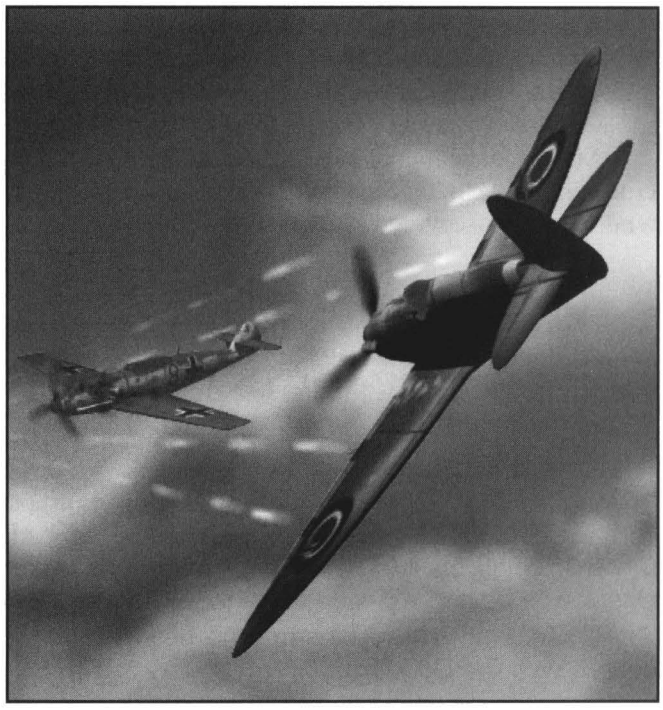
In one attempt to trap the British, Kesselring sent over small formations of Do 17s and He 111s, then sent out huge armadas of 109s and 110s. The scrambled RAF squadrons were recalled and prevented from meeting the enemy fighters in such numbers.

August 30, 1940

Weather: Clear
Official Losses: Luftwaffe—36; RAF—26

After an earlier decoy attack by Do 17s and Me 110s, the real attacks began in the mid-morning. Ignoring a force of 60 109s, Park prepared to meet the expected onslaught of bombers. He was

not to be disappointed as a wave of 40 Heinkels and 30 Dorniers attacked soon after, with an escort of about a hundred 109s. Park had to scramble every available aircraft and asked again for help from Leigh-Mallory's 12 Group. However a Staffel of Ju 88s broke through and hit Biggin Hill very hard.



This attack was followed by another, again aimed at the forward airfields like Kenley, Biggin Hill, Tangmere, and Shoreham. And, to make matters worse, seven radar stations suddenly went blank in the middle of the battle, their electricity having been cut. Meanwhile, another raid was on the way.

At this time, the head-on attack against bombers, which had previously lacked official approval, became standard operation. It was necessary to break up the bomber formations before they reached the target, and the head-on attack was the most devastating and frightening to the bomber crews. With their increasing use of armor in the bombers, the nose was the most vulnerable location, and, lacking forward armaments, the safest from which to attack. However, there were many collisions because, with a closing speed of around 600 miles per hour (about 300 yards per second) and a gun range of only about 300 yards, the timing was split-second. There was only time for a one-second burst before pulling out.

How Do You Know?

"Donald Stones of 79 Squadron recalled a head-on attack on 30 August which dramatically demonstrated to them all just how fine the timing had to be. Teddy Morris, a South African who had been carefully briefed on this form of warfare, was among those who bored into a huge formation of He 111s. He did not evade in time and bounced off the nose of a 111. The impact destroyed it, and his Hurricane.

"He found himself still strapped in his seat, surrounded by debris from both aircraft, pulling his ripcord. He suffered only a broken leg, and loss of confidence in our advice. When we saw him in sick quarters he complained, 'I thought you told me they would break formation if we pressed home a good frontal attack.'

"'No, Teddy,' we said. 'They don't if the pilot is dead. You are supposed to allow for that.'

"'How the hell are you to know if he's dead or not?'

"'The way you did,' seemed to be the only answer."

(from **Battle of Britain**, Hough & Richards)

Elsewhere, Wing Commander Tom Gleave, judged to old to be flying as a Squadron Commander found his way into a group of 109s. Amazingly, in his first action, Gleave shot down four of the enemy before running out of bullets. His fearless close approaches meant that his shots were devastating. He shot from distances ranging from 175 yards down to 60 yards.

More experienced, but less lucky that day, Sergeant Ginger Lacey had to coax a dead Hurricane back from the Channel and into a landing at his airfield. He made a perfect landing where it was discovered that his plane had absorbed 87 hits.

SPITFIRE MISSION 5

A group of Do 17s escorted by Bf 110s are attacking a convoy in the Channel.

Historical Engagement

On August 30th, a group of Do 17s from Luftflotte 2 attacked a convoy in the Thames Estuary. The medium bombers were escorted by Bf 110s from III/ZG 76. Spitfires from the 54 Squadron flying from Manston were vectored to intercept the raid. The bomber attack was beaten off and the convoy escaped unscathed.

Take off from Manston and head north following your flight leader on a intercept course with the Dorniers.

Air/Ship Initial Position:

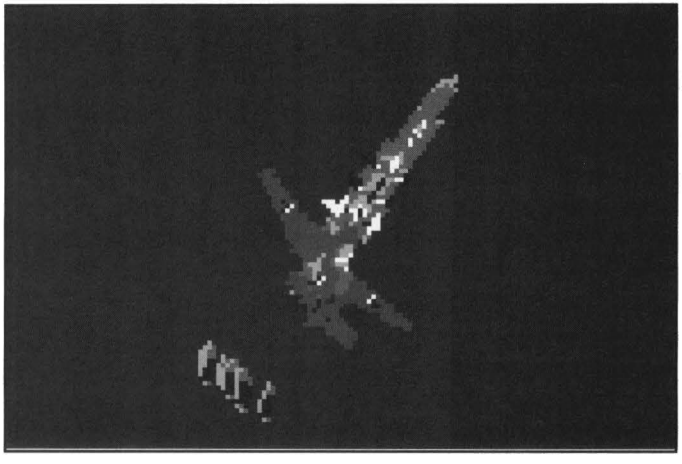
2 ships are 17 miles NNW.

You and your flight leader are on the ground at Manston airfield.

2 Do 17s are traveling at WNW at 2,000 feet at 14 miles NE.

2 Bf 110s are escorting the 2 Do 17s at 4,000 feet heading West, 15 miles ENE of you.

3 Do 17s are traveling at 3,000 feet heading NW at 24 miles, ESE.



Strategy

Take off and follow your flight leader to rendezvous with the enemy in the Channel. Make sure you adjust your speed so that you don't overtake your flight leader and at the same time make sure he doesn't pull away from you too far and face the enemy alone. Ideally, you should take off with 100% power and then ease back on the throttle to about 93%. You and the flight leader will be going

after the first group of Do 17s first, then after they are destroyed, taking out the Bf 110s. If you watch the flight leader's approach to the Do 17s, he will give you insight on how your attack approach should be. After the first group has been destroyed, follow the flight leader to the second group of Do 17s (if he's still alive). Again follow his attack method. Even if you only damage the Do 17s they will drop their bombs over the water and run for home.

DO 17 MISSION 2

Attack two ships in the Thames Estuary. Watch out for Spitfires intercepting from Manston Airfield.

Cross Reference: Spitfire mission 5

Strategy

As you begin this low mission the convoy of two ships is west of you. Change your course WSW and line up the closer ship on the center bar in you windshield. Since you're flying at 2,000 feet, jump to the bomber's position as soon as the ship disappears from the pilot's view. Once the ship appears on the range finder, immediately release two bombs. Jump back into the pilot's seat and continue flying in the WSW direction for about one minute, and then turn right until the second ship comes into view. Again, line up the second ship with the center bar of your windshield and bomb the second ship as you did the first. It's much easier to bomb ships if you approach the ship targets from bow to stern or vice versa. Bombing a ship from the side takes great precision since you only have the width of the ship as a target rather than the length which is always much greater. Once your bombs are released, power up to 100% and head for home.

HURRICANE MISSION 5

A small formation of He 111s with heavy Bf 110 escort attacks an aircraft factory. Evade the fighters, and destroy the bombers.

Historical Engagement

On August 30, a group of He 111s from II/KG 2 with an escort of Bf 110s came in over the English coast north of the Thames. Although they were engaged by a strong group of Hurricanes from 242 and 501 Squadrons, they penetrated to Luton where they bombed the Vauxhall works. Extensive damage was done to the factory and there were heavy casualties.

You are on patrol over the Vauxhall works where a He 111 bombing is imminent. The He 111s are protected by a a strong escort of Bf 110s. Dodge the escort, taking advantage of your superior maneuverability, and shatter the He 111s.

Initial Aircraft Positions

You and your wingman are on patrol at 10,000 feet over the Vauxhall factory.
2 Bf 110s are at 11,000 feet heading WSW, 9 miles East of you.
2 Bf 110s are at 12,000 feet heading West, 15 miles ESE of you.
2 Bf 110s are at 10,000 feet heading North, 20 miles East of you.
2 He 111s are at 11,000 feet heading West, 18 miles East of you.

Strategy

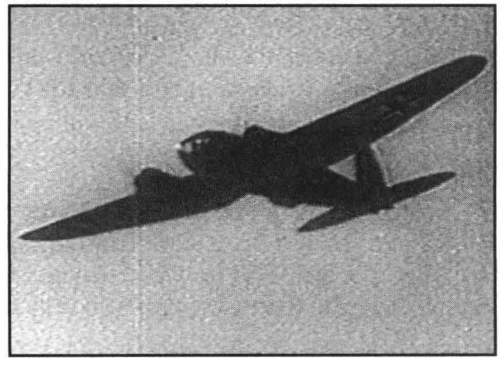
Head East and avoid the Bf 110s until you reach the He 111s. At all costs, take out the He 111s, first. More Bf 110s join the fight later, so you'll need to take on the He 111s early in the scenario. The Bf 110s are not as maneuverable as the Hurricane so use your maneuverability to your advantage in the dogfights. Tight turns, rolls, and loops are good defensive tactics against the Bf 110s. You may find it hard to distinguish the He 111s from the Bf 110s from a distance the first few times you play this scenario. A good way to find them in the crowd is to look for the planes that are in a tight formation and flying in level flight heading west toward the factory. Shooting them down from behind is your best bet. Remember, Bf 110s have a tail gunner, so watch your approach when attacking. Don't let the tail gunner get a good fix on you.

HE 111 MISSION 2

Bomb the factory at Vauxhall. Bf 110s provide protection from fierce Hurricane attacks.

Cross Reference: Hurricane mission 5

Strategy



Turn on your automatic gunners for all gunner positions. The target is just in front of the light green area due west. The Bf 110s will provide some cover if they're good enough. Try and select a Bf 110 crew that has the most experience for this mission. Once the light green area disappears from sight switch to bomber view and line up the target to the center line of the target scope. The bomb release point is just past the second range ring of the target scope. Release one bomb, at a time one every second. You may want to save a few bombs, just in case you miss. On the way back to base, you can jump in any of the gunner positions if you wish. Increase your throttle to 100% until you're well over the Channel, or you reach 1/2 a tank of gas.

BF 109 MISSION 4

In a free ranging fighter sweep, clear a path for He 111 bombers on their bombing mission against the Kenley field.

Historical Engagement

On August 30, 1940 the Bf 109s of Luftflotte 2 were unleashed to sweep across southern England and clear the way for subsequent He 111 bombing missions against Fighter Command airfields including Kenley and Biggin Hill. The tactic was to exhaust and destroy any British fighter resistance with Bf 109 attacks so that the bombing attacks would fly unopposed. Keith Park understood the Luftwaffe's intentions and sent his fighters only when the bombers appeared on the radar screens.

Fly your Bf 109 in a free ranging sweep ahead of the He 111 group which is attacking Kenley Airfield. Protect the He 111s by flying ahead of their formation and intercepting the attacking Hurricanes before they reach your bombers. After your bombers hit Kenley protect them on their flight to the Channel.

Starting Positons

You and your flight leader are on patrol at 12,000 feet.

The 2 He 111s you are escorting are directly behind you at 10,000 feet heading North to the target at Kenley.

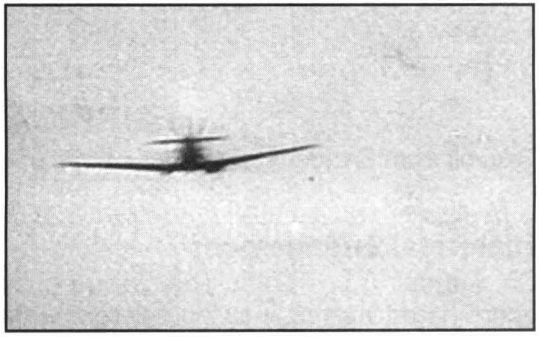
2 Hurricanes are at 10,000 feet heading East, 7 miles NW of you.

2 Hurricanes are at 11,000 feet heading WSW, 11 miles ENE of you.

1 Hurricane is at 10,000 feet heading WNW, 19 miles South of you.

Strategy

When you start this mission you are flying South with your flight leader towards the He 111s you are protecting. Follow the flight leader in a 180 deg. turn to NW and follow him in engaging the first group of Hurricanes. After they are disabled, move ENE to engage the second group of Hurricanes. As the bombers get close to the target more Hurricanes will join the action so use your ammo sparingly. Watch your fuel level as well. Once the bombers have finished their attack run follow them over the Channel. You'll be engaging more Hurricanes as you leave England. This is one of those missions that can be played very easily if you have an experienced crew. Since so many Hurricanes are involved in this mission, having a good flight leader and bomber crews will help eliminate a lot of the pressure.



August 31, 1940

Weather: Clear
Official Losses: Luftwaffe—41; RAF—39

The Luftwaffe seemed, at last, to have hit upon an effective strategy. Now they combined their raids with superb timing, often catching the British pilots still on the ground, or just taking off. The RAF losses on this day were the highest of the Battle and nearly equalled those of the Luftwaffe. The dangerous Erpro 210 was back in action, and hit several radar stations, then returned in the afternoon to attack Biggin Hill in one of two raids to do so that day. Hornchurch was also bombed by high-flying Dorniers. In the attack, three Spitfires were destroyed before they could take off. One of them belonged to the veteran Al Deere, whose subsequent tumbling, upside-down careening down the airstrip almost cost him his life. He was rescued, however, and he and the other two pilots whose planes had been destroyed were all flying again the next day.

Another veteran pilot who barely escaped death was Peter Townsend who was shot down by a 109 near North Weald. He hit the shrouds and came down with an injured foot. He lost a toe and was out of action for three weeks.

Still another close escape happened when Tom Gleave, so successful the previous day, was shot down and parachuted safely, but with horrible burns.

Chivalry in the Air

Although there was much controversy over the shooting down of parachuting pilots, there were, in fact, few incidents of such occurrences. For the most part, there was a sense of the continuing chivalry among pilots as evidenced from this statement by Erich Rudoerffer, one of the top German aces with 222 victories by the end of the war: "Once—I think it was 31 August 1940—I was in a fight with four Hurricanes over Dover. I was back over the Channel when I saw another Hurricane coming from Calais, trailing white smoke, obviously in a bad way. I flew up alongside him and escorted him all the way to England and then waved goodbye. A few weeks later the same thing happened to me. That would never have happened in Russia—never."

Although this story is somewhat hard to believe considering the fierceness of the fighting and the importance of victory for both sides, it is worth taking into account. Of course, many combatants did not see things with such generosity. The Poles and the Czechs, in particular, had a burning hatred of the Germans and did not give, or ask, any quarter.

HURRICANE MISSION 8

Take off from Croydon to intercept a wave of Do 17 bombers attacking your airfield and Biggin Hill.

Historical Engagement

On August 31, 1940, the German attacks on Fighter Command's airfields were coordinated perfectly to completely surprise the RAF defense. Biggin Hill and Croydon

were attacked by Do 17s escorted by Bf 110s. The Do 17s employed a low-level attack that gave the airfields little warning. At Croydon, the Hurricanes of the 85 Squadron were caught on the ground while taxiing for takeoff and had a difficult time intercepting the bombers and their escort. Both airfields suffered heavy damage.

You are sitting in your Hurricane of the 85 Squadron on the runway at Croydon. Do 17 bombers are right on the horizon making their bombing run. Get airborne quickly, and intercept the attacks on your airfield and Biggin Hill. Avoid the Bf 110s and concentrate on the Do 17s.

Initial Aircraft Positions

You are on the ground at Croydon Airfield.

Your wingman is at 1,000 feet heading West 15 miles ESE of you.

2 Bf 110s are at 2,000 feet heading North 10 miles S of you.

1 Do 17 is at 2,000 feet heading WNW 20 miles ESE of you.

1 Bf 110 is at 4,000 feet heading NW 21 miles SE of you.

1 DO 17 is at 2,000 feet heading NW 25 miles SE of you.

1 Do 17 is at 3,000 feet heading North 30 miles South of you.

1 Do 17 is at 4,000 feet heading NNW 40 miles SSE of you.

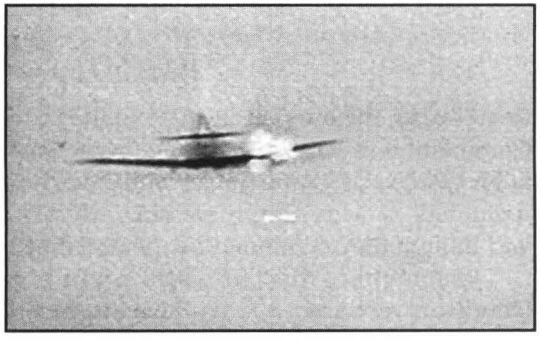
Strategy

Head to the first Do 17 making its bombing run on Biggin Hill. If your wingman is good enough, he may take out the Do 17 before you get there. Watch out for the Bf 110s on your way there. Use your superior maneuverability to avoid them. A second Do 17, with a Bf 110 as an escort, is close behind the first one. Concentrate on the Do 17s and at all cost protect your wingman. After the first two Do 17s have been eliminated, head for Croydon. You don't have much time to get there, so, try to avoid the Bf 110s if you can. After the third Do 17 has been eliminated, you'll have a few minutes to take out whatever Bf 110s remain. You should do this on your way back to Biggin Hill where the last Do 17 is making its attack approach. Pick your wingman carefully for this mission. If he's good, he'll do a lot of the dirty work for you.

BF 110 MISSION 1

Escort a pair of Ju 88 medium bombers on their attack on Biggin Hill.

Cross Reference: Hurricane mission 8



Strategy

As you trail the bombers to their target at Biggin Hill, two Hurricanes are approaching from the WNW and NNW. The Hurricane at NNW will engage the bombers first over the target. Move slightly ahead of the bombers and engage this fighter. As you engage him, the second fighter will be approaching the group. Take the first one out quickly, and engage the second fighter. As you engage the second fighter, the bombers should have released their bombs and be heading for home. Make sure you keep up with the bombers on their trip back. About half way to the home field you'll engage three more fighters. The first one will come from the North and the last two will come from the East. By slightly trailing the bombers on the return trip, you can turn and take on the fighter from the North head-on. After you have finished him off, move ahead of the bombers and make a head-on approach to the two remaining fighters from the East. After all of the fighters have been destroyed, make sure you stay with the bombers until you're over France. If you leave the bombers unattended, even when no fighters are present, one of the bombers may get listed as destroyed on the mission score screen.

BF 110 MISSION 8

Escort a group of Do 17s on their bombing mission against the North Weald Airfield. A strong force of Hurricanes oppose you.

Strategy

As you begin this mission, you are leading a group of Do 17s on a bombing raid of the North Weald Airfield. Set your rear gunner position on automatic. One Hurricane is approaching from the west. Once you reach the airfield, circle and use your dogfighting skills to engage any fighters that appear and protect your bombers as they approach you for their bombing run. Once the bombers have dropped their bombs follow them home and engage any fighters that threaten them.

September 1, 1940

Weather: Clear

Official Losses: Luftwaffe—14; RAF—15

In assessing the damage at this point, it could only be said that the previously stretched Fighter Command was near to snapping. In the past two weeks, they had lost 200 more fighters than had been produced, and, more importantly, almost a quarter of their pilots had been killed, wounded, or were simply missing. Most of the critical airfields had suffered extensive damage, and though they continued to operate, they could not do so at full efficiency.

Meanwhile, the Luftwaffe again began to express confidence, with some exceptions. Deighton recounts a story of a captured German pilot who was being taken by train to

internment when a waitress ran up to the train window and proffered a collection box marked as "Mayor of Chatham's Spitfire Fund." The German asked for his wallet and deposited a five-mark note.

Coincidentally, Chatham was one of several targets hit on this day. Others included Tilbury and Debden. More severely hit were Biggin Hill, Eastchurch, and Detling.

September 2, 1940

Weather: Clear
Official Losses: Luftwaffe—35; RAF—31

An early raid of Dorniers from Gruppe KG 3 flew toward the southeast accompanied by an escort of Me 109s from JG 51. They were met by 603 Squadron's Spitfires who shot down four 109s over the Channel, including the infamous Luftwaffe ace Heinz "Pritzl" Baer (who was later rescued).

On this day, the Germans began to attack the aircraft factories, including the Short Brothers again and a Vickers factory producing Wellington bombers.

Also targeted were Biggin Hill, Lympne, Detling, Eastchurch (three different times), Hornchurch (twice), and Gravesend.

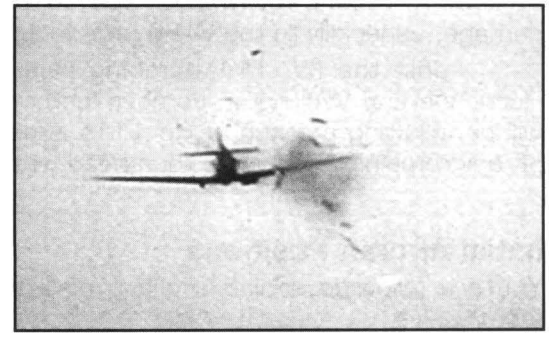
September 3, 1940

Weather: Clear
Official Losses: Luftwaffe—16; RAF—16

On this day, Hitler decided to postpone the invasion from September 15 to September 21, with the ultimate decision still resting with him.

More airfields were attacked, including Manston, West Malling, and North Weald which was heavily hit. Meanwhile, Göring met with his commanders at The Hague and assessed the situation. There were sharp differences of opinion, with Göring siding with the more optimistic Kesselring who believed the RAF to be on its last legs while Sperrle cast the dissenting opinion that the RAF was still very much in the running. With winter weather approaching, they all agreed that they had to force the issue and eliminate the RAF before weather conditions began to become unfavorable. Certainly the British would send all their fighters up to defend London.

On the other side of the Channel, it looked as if the end could be even nearer than Kesselring and Göring thought, and was closer to Sperrle's estimation. Although the Brits could still field about 700 fighters, the RAF was rapidly sinking for lack of experienced pilots, and their airfields were a shambles. Losses had continued to mount, and on this day, where 16 British fighters were shot down to sixteen Luftwaffe planes, the odds seemed to be tilting steadily against Dowding and his "chicks."



September 4, 1940

Weather: Clear

Official Losses: Luftwaffe—25; RAF—17

The Luftwaffe strategy on September 4 was to bomb the British aircraft factories. Consequently, two sizable raids were mounted. The Short Brothers works received yet another attack, and the Hawker factory at Brooklands (where they made Hurricanes) was the target of an attack. However, the attacking force was intercepted before reaching their target and six Me 110s were shot down in a brief, but fierce, battle. However, enough planes got through to do significant damage, but by luck, misinformation on the Germans' part, or for unknown reasons, the bombers hit the Vickers' machine shops instead of the Hawker factory. More than 700 people were killed. This was the worst incident in terms of human life to date.

The raids on airfields also continued with Lympne and Eastchurch getting plastered again.

Hitler also made a speech in which he threatened the British with invasion and vowed to retaliate for the British bombing of Germany.

HE 111 MISSION 1

Attack two factories vital to the British aircraft industry. Bomb the Hawker Hurricane and Wellington bomber factories

Historical Engagement

As the Luftwaffe targeted Fighter Command's airfields for destruction, they realized that they needed to destroy the fighters at their source—the factories that produced the Hurricanes and Spitfires. On September 4, 1940, a bombing raid was designed for just this purpose. A formation of He 111s attacked the Hawker Hurricane factory at Brooklands and the nearby Wellington bomber factory. Hurricanes of 253 Squadron intercepted too late to prevent damage, especially to the Wellington factory.

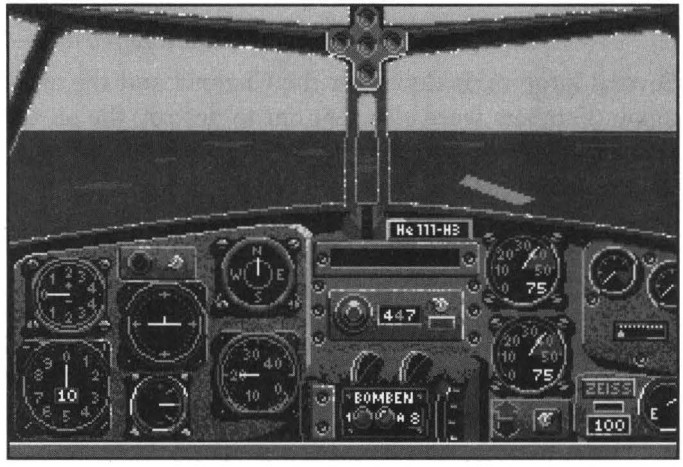
A train of bombs destined for a Heinkels.

Join the He 111 bombing raid on the Hurricane and Wellington bomber factories. You will be following a group of He 111s aimed at the Hawker factory. When you arrive finish off any remaining buildings, then head west to the Wellington factory.

Initial Aircraft Positions

You are following behind a group of 3 He 111 bombers heading north to the Hawker factory.

Strategy



Follow the the main group of bombers to the primary target at Hawker factory. You'll want to switch your gunner positions to automatic because, as soon after you make your bombing run, Hurricanes will appear. The first target is slightly right of the first light green patch you see in the distance. Slightly alter your course so that the green patch is between the two main supports of your wind screen. As the patch disappears from view below you, switch to the bomber position leaving the auto pilot off. You should see the building approach at the top of the screen. You may have to make a minor course adjustment to the right to line up the building exactly in the center. Once the building reaches just slightly beyond the second range circle on your target scope, let one bomb go every second. Don't let more than four bombs go to the primary target, you need to save some for the secondary target.

An He 111 crashes and burns.

Now turn in a westerly direction towards the second target. You should be getting company from the Hurricanes at about this point. The second target is hard to find because there are no visible references to its location from the pilot's view. Switch between the map view and bomber's view to home in on the second target. If all else fails and you can't get a good shot at it because of the Hurricane heat, go back to the first target and release the rest of your bomb load using the same tactics as before. As you head for home, spend some time in the gunner positions if you wish. If your gas gauge still reads over 1/2 a tank, you can increase your speed by throttling up to 100%. This is about the only defensive tactic you can use in a bomber while in enemy airspace. The Hurricanes will have a tough time keeping up with you. Once your gas tank reaches 1/2 a tank, or you make it over the Channel, then you can throttle back to 75%.

September 5, 1940

Weather: Clear
Official Losses: Luftwaffe—23; RAF—20

Several large raids flew over the Channel and the airfields at Biggin Hill and Detling were hit again. Bombers were also sent out to destroy the oil tanks at Thameshaven. A small amount of damage was caused at the Hawker works in Brooklands.

September 6, 1940

Weather: Clear
Official Losses: Luftwaffe—35; RAF—23

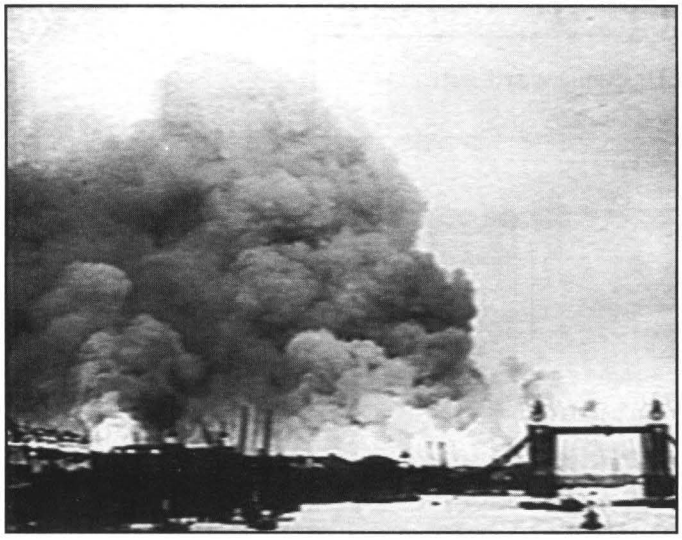
More airfield attacks, including Biggin Hill, and attacks on aircraft factories at Rochester and Weybridge. The British prepare for invasion, having spotted (and having begun to attack) build-ups of landing craft in Dutch, Belgian, and French ports.

The new battle ground.

September 7, 1940 and after.

Weather: Clear
Official Losses: Luftwaffe—41; RAF—28

This is another critical turning point. By now, the RAF is in serious trouble. Lack of replacement aircraft, but even more importantly, a shortage of pilots is straining Fighter Command. The airfields are taking a beating and are having a hard time continuing operations. At this point, in retrospect, if the Luftwaffe had continued with their strategy, they might well have beaten the fading British defenses, but, miraculously, they switched their strategy at this critical moment



As the Germans changed strategies...

September 7 was to be the critical one that ultimately led to that decision. Eight days later, the Luftwaffe had not achieved its objective, and, on September 15, henceforth known as Battle of Britain Day, the RAF beat off a determined daylight attack on London, shooting down 60 German planes and losing 26. Two days later, Hitler postponed invasion plans indefinitely.

But the British didn't submit to German aggression. London survived the Blitz.

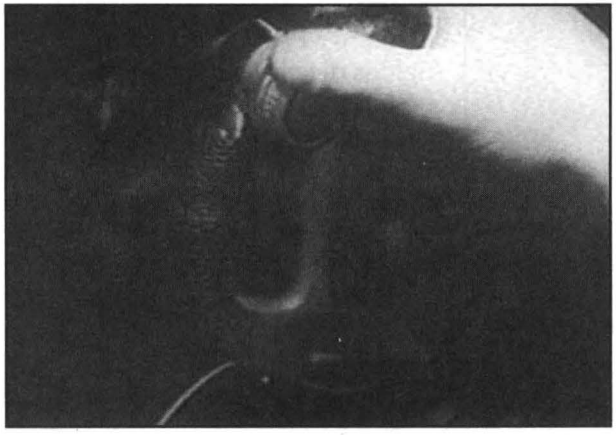
and began attacking London.

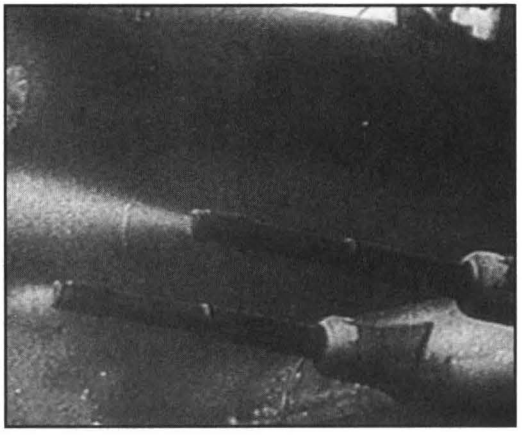
This could not have been more welcome by Churchill, Dowding, and the rest of the high command. They knew that London could withstand a great amount of punishment and still survive. The same could not be said of the dwindling and overworked fighter defense network. Though the official Battle of Britain was to continue over several more weeks, this was, in effect, the end of the threat of invasion. It took Hitler until October 12 to shelve the invasion plans until the spring of 1941 (by which time it was another story altogether), but the decision of

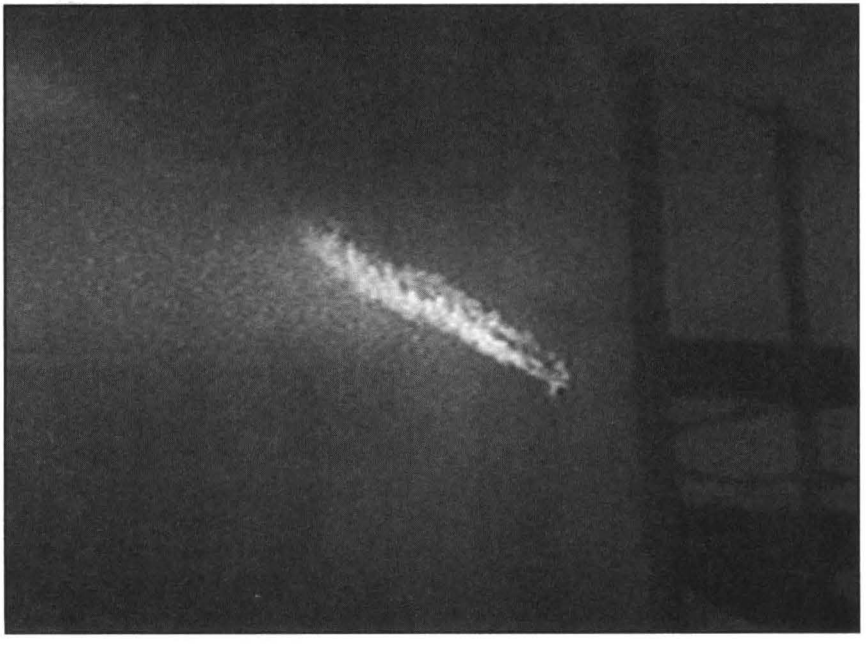
London was pounded by bombs night after night.

Then, after several days of bad weather, the Luftwaffe tried again to beat down the British, finally abandoning the daylight bombing raids in the face of consistent losses and the obvious continued resistance, and turned to night bombing of London. The London Blitz was in full swing. Even though, for the sake of history, the official end of The Battle of Britain was October 31, 1940, when the Germans abandoned daylight bombing, The Battle of Britain was truly over.

And the fighting went on...







Chapter 7
Campaign Strategies for The Battle of Britain

INTRODUCTION

Once you've flown the training missions and tried your hand at the historical simulations, you may be looking for a new challenge. How about putting your back against the wall and fighting off the German air armada practically single-handed? Or how about trying to accomplish what Hitler and Göring failed to do?

Playing the Campaign in BOB is the ultimate challenge. If you can succeed here, you've really earned your Distinguished Service Cross and bars (or Knight's Cross with Oak Leaves, perhaps). But it certainly won't be easy, and nobody can make it so. Here, however, are some tips that might help.

BIG TIP!

The best ally you can have in the Campaign is a good group of Top Aces to help you destroy the enemy. If you're serious about the Campaign, you should be sure to develop a few squadrons of highly experienced and successful pilots and crew. If you want to know more about creating and maintaining pilots and crew, read the chapter entitled "The Care and Feeding of Pilots."

CAMPAIGN TIPS

Playing the German side

- Start your flight groups as close to the target as possible. There's really no reason to start your flight groups far away. This is especially true of coastal targets like the radar installations. If you start at a distance (maybe 10 miles) from your target, your flight groups will encounter more enemy aircraft on their way to the target.

- If you don't have good bombing skills, fly an escort plane and let the computer fly the bombers. The escort plane you fly should be one that ultimately protects the bombers from hostile attack.
- As a beginner you should try to attack the radar installations first, followed by the airfields, factories, and headquarters, respectively. By eliminating or significantly damaging the radar installations, you'll increase the response time of the enemy fighters because the British won't be aware of your presence as quickly.
- When you're making up your flight groups, you should have one or two fighters and the rest bombers. You need plenty of bombers because they are the ones that will ultimately do the damage to the selected target. Try mixing up the flight groups at different altitudes. This will require the British to cover these flight levels, thus reducing their concentration of attack at any one point. Having fewer RAF enemies on your tail will increase your chances of survival.
- We'll repeat: Play the combat flights and build up good pilots for the campaign. By using the computer pilot, you'll end up with a fairly mediocre pilot. It's best to create your own pilots and build up their skills in the combat flights. For more on building pilots see the chapter entitled "The Care and Feeding of Pilots."
- Advanced players should try deep penetration missions against the factories and headquarters since these are the most challenging, and, if successful, will most quickly bring about victory.
- Remember, individual mission scores do not necessarily reflect the outcome of a campaign. The overall success of a mission will determine how the campaign will proceed and your eventual victory or defeat. Therefore, remember the goal of the mission. If you're trying to bomb a radar station, don't go chasing off after a stray fighter in order to raise your kill score. Make sure the bombs drop on their targets.

British Strategy

The attacks of the day are always presented to you at the start of the mission. Place a flight group directly over the target with yourself in that flight group at a fairly high altitude (15-20,000 feet). Make up other flight groups nearby with a good mixture of aircraft at different altitudes. You want to be prepared and on the lookout for enemy craft approaching at low altitude.

The aircraft in your flight groups should be set up in the following manner:

- Use your Hurricanes to attack the bombers. The Hurricanes can handle more hits from enemy gunfire than the Spitfires and are better suited for this purpose.
- Spitfires should be used to intercept the enemy fighters since they have better performance characteristics.
- Remember your goal is not necessarily to shoot down every plane that flies over England. In many cases, you'll be more effective if you can just harass the bombers into dropping their bombs and turning back. It's better to force back three bombers than to shoot one down and let two others hit the target. Sometimes a few good squirts of lead can discourage a bomber and make it turn back.

Chapter 8
BOB Scoring Information

If you've flown a lot of BOB (Battle of Britain) missions, you've probably wondered what contributed to your score. Here's some information that might help you.

Points for Downing a Plane

Spitfire	6
Hurricane	6
Bf 109	7
Bf 110	6
Ju 87	5
He 111	9
Ju 88	10

The Pilot or Plane's Disposition Makes a Difference,Too

- If the pilot is a Top Ace, the point value is 300%.
- If the pilot is an Ace, the point value is 200%.
- If the aircraft is non-evading, it's worth 3 points only.
- You also get 2 points for each plane you damage.

Landing at Home Airfield Bonus

Spitfire	6
Hurricane	6
Bf 109	7
Bf 110	6
Ju 87	5
He 111	9
Ju 88	10

Ground Target Scoring

Gound target scoring is a bit more complicated than aerial scoring. To understand how it works, you must calculate the bomb damage according to a formula that includes values for direct hits and near misses (which also cause damage). The formula also takes into account the actions of other planes in your flight group as well as other planes on your side. The formula is

ground points = (weight on target)/100 + (direct hits * direct hit bonus) + (near hits * near hit bonus)

	Direct Hit Bonus	Near Hit Bonus
Bf 109	15	5
Bf 110	10	3
Ju 87	15	5
Do 17	5	2
He 111	5	2
Ju 88	5	2

For other planes in the same flight group: (weight on target)/200

If you're flying escort for the bombers: (weight on target)/200

Score for bombs dropped by other planes on your side: (weight on target)/300

For each ship sunk: 20 points

Ways to Lose Points

	Bomber	Non-bomber
Lost Leader	5	25
Lost Wingman	3	15

If escort and bomber are lost: 20 points

If escort and plane in flight group you're supposed to protect: 40 points

Each time you hit a friendly plane you lose 1 point.

You lose 4 points if your plane is damaged.

You lose 10 points if your plane is lost.

If your mission is to intercept bombers, you lose points by the formula: (weight on target/100).

MEDALS AND RANKS

RAF ranks:

Lieutenant ..... 0 (new pilot)
Flying Officer 100
Flight Lieutenant 325
Squadron Leader 675
Wing Commander 900
Group Captain 1,750

RAF medals:

Distinguished Flying Cross 200
Distinguished Service Order 475
George Cross 1,250
Victoria Cross 2,500

Luftwaffe Ranks

Leutnant ..... 0 (new pilot)
Oberleutnant 100
Hauptmann 300
Major 675
Oberstleutnant 1,000
Oberst 2,000

Luftwaffe medals:

Iron Cross, 2nd Class 200
Iron Cross, 1st Class 500
Knight's Cross with Oak Leaves 850
Knight's Cross with Oak Leaves and Swords 1,250
Knight's Cross with Oak Leaves, Swords and Diamonds 1,600

THE CARE AND FEEDING OF PILOTS

All three of the Lucasfilm historical flight simulations allow your pilots to progress—to have a career, more or less. It's up to you to make sure they are taken care of and that they reach the highest rank possible. Why? Simply because, at a higher rank, they will perform better in battle. Their aim will be a little sharper, their instincts a little better. Oh, and their chests will be covered with medals, if that matters to you.

The trick to succeeding in the harder scenarios in these games is to choose wingmen who are of an advanced skill level, but how do they get there? How did a lowly recruit make it to Captain or Oberst, or even better? In this section, you'll learn some of the basic tricks in the care and feeding of pilots.

Get Some Experience

The first thing your new pilot needs is experience, and the only way to obtain experience is to get into the air. So you can create a new pilot and immediately send him out against the best the enemy has to offer, or you can bring him up slowly. Tragically, many new pilots had the former experience, and were killed before they ever even upacked their trunks at their new base. You can be kinder to your pilots than either the RAF or the Luftwaffe was able to be.

Perhaps the best way to bring a pilot up slowly is to use the Mission Builder to create an easy mission—a cakewalk for your new recruit. Check out Appendix B to learn more about using the Mission Builder. You can create any kind of mission you want. Make it easy or make it challenging. For building your pilot, however, you should probably make it pretty easy; perhaps a couple of bombers with no escort.

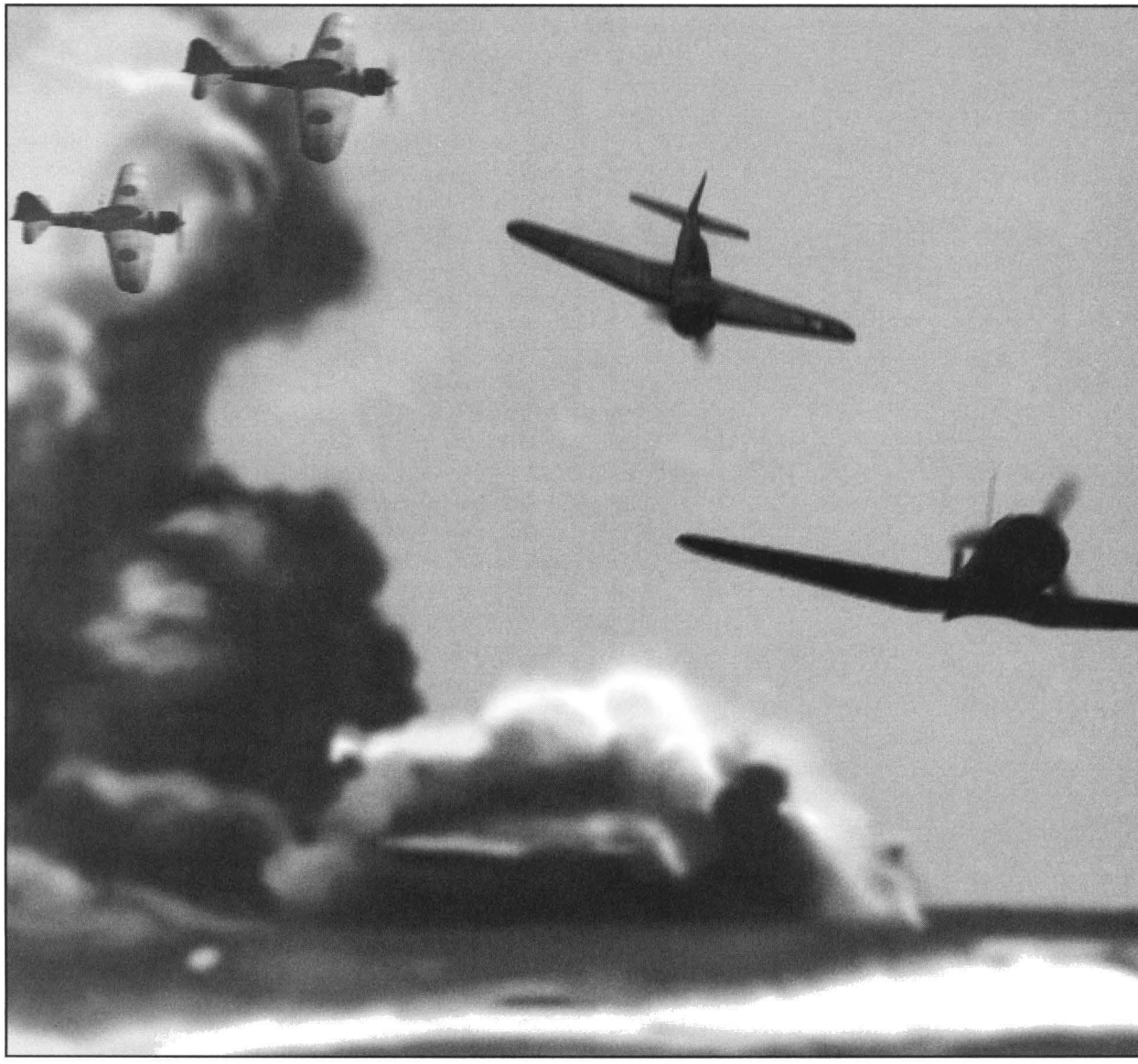
Of course, you may fly the same pilot for a long time, but there's always that black day when he gets shot down and killed. It's part of the game, just as it was part of the real war. Fortunately for you, there is a way to prevent total disaster. This is a game, after all. You'll have to quit the game, but at the DOS prompt you can find the file that represents your pilot. If you list the \BOB directory, you'll see your pilot's name followed by an extension that represents the kind of plane he flies. For instance, if your pilot is MAX and he flies a Bf 110, then his pilot file will be called MAX.110. On the other hand, all RAF pilots have the extension .RAF.

To back up your pilot file, simply use the DOS Copy command. For instance, type *Copy MAX.110 MAX.BK1*. That copies your pilot's file to a different one with the extension .BK1. If something bad happens, simply copy that file back to the original name, and you'll have resurrected your pilot.

With some experimentation, you may find that pilots from one kind of plane can be copied to another kind. For instance, an ace Bf 109 pilot could be turned into a Bf 110 pilot by copying his file with a new extension.

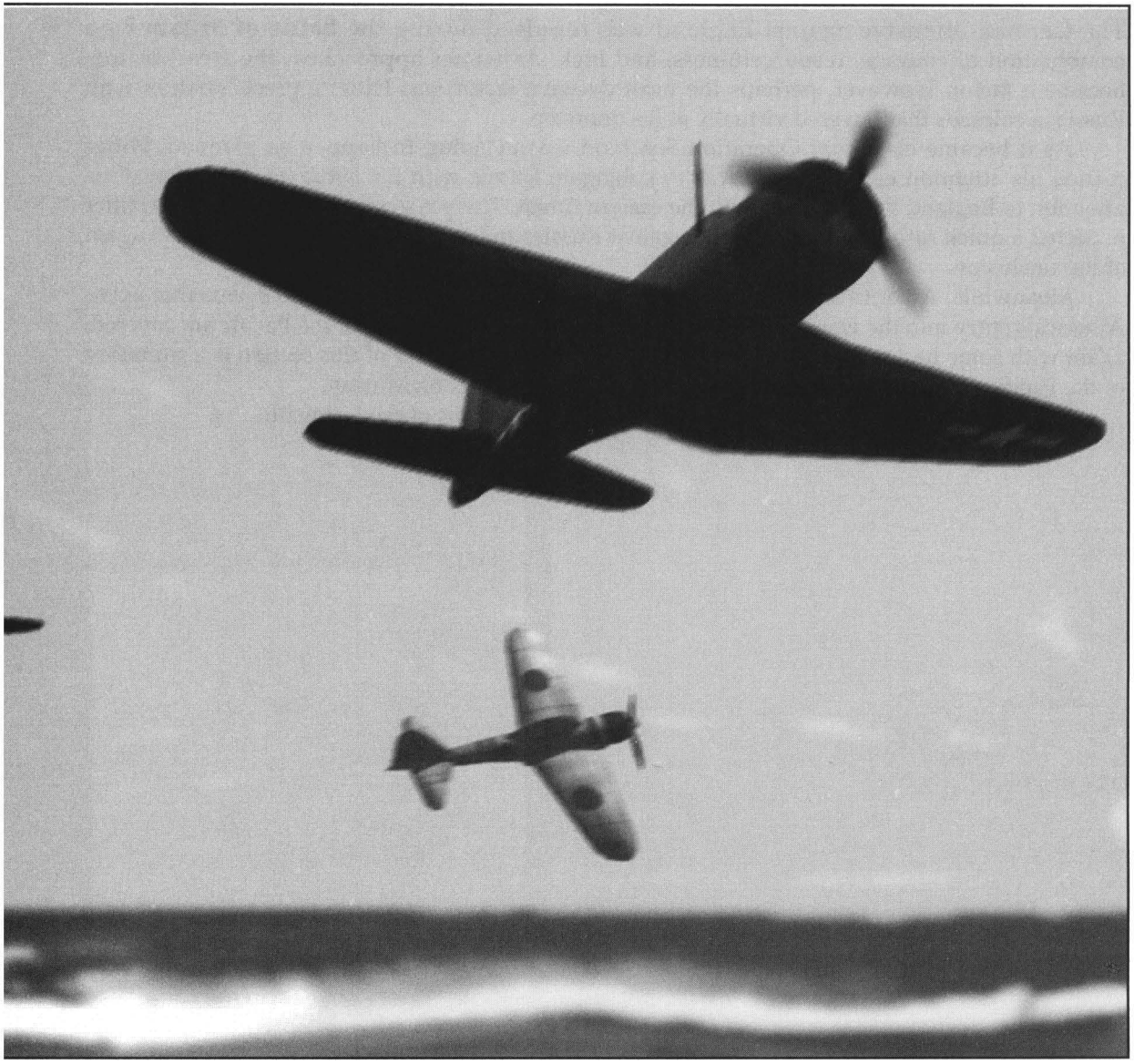
Then there is the clone feature. Well, not really a feature. But you can simply copy any good pilot to different names. Instantly, you'll have a whole flight group or *gruppe* of great pilots to use as wingmen. As you probably already know by now, good wingmen and support pilots and crew can be a big help. They shoot straighter, think quicker, and die less often. Most people do clone their best pilot to use in the missions. You can give the pilots any name you wish (as long as it fits into the DOS name structure). This is basically true of other versions of the program as well.

PART II
BATTLEHAWKS 1942



Drink and sing, an inch before us is black night.
Japanese proverb

THE PACIFIC WAR



Up til now...

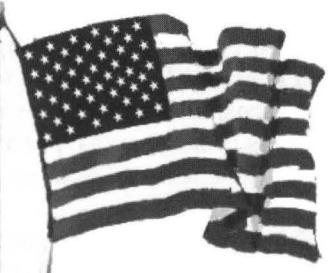
The German offensive against England was repulsed during the Battle of Britain by a combination of courage, resourcefulness, and luck. As winter approached, the weather, too, became a factor. However, perhaps the most decisive factor was Hitler's preoccupation with Russia, a colossus that hovered virtually at his doorstep.

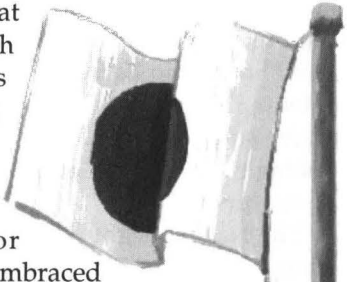
As it became clear that Operation Sea Lion wasn't going to happen as planned, Hitler turned his attention east. His goal was to subjugate Russia with his *blitzkrieg*, then return his attention to England after dealing with the eastern threat. There is evidence to suggest that Hitler expected a quick resolution to the battle against Russia, and that he would attack England again at its conclusion.

Meanwhile, America's neutrality remained, as Hitler hoped it would. The events that led to America's entry into the war, and the early battles that decided the fate of the Pacific are covered, again with some necessary brevity, in this section. The final chapter of this section is a summary of the Pacific war by the noted professor and historian Williamson Murray.

The European conflict continues in Part III, Secret Weapons of the Luftwaffe.

Chapter 9
Pacific Prelude





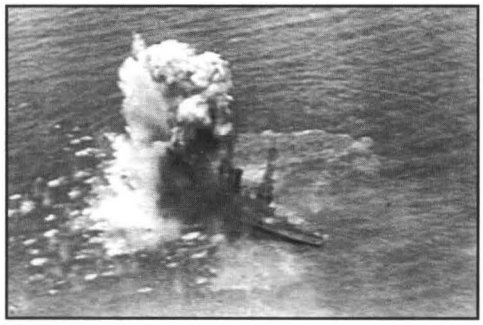
In today's society, we look back at our country's history of war with varied sentiments. Our opinions are shaped by many factors, not the least of which is whether we perceive the war in question to be a just or necessary one. Many wars have been unpopular or controversial. A few have been embraced with total conviction. There's no question that our attitudes about wars such as Vietnam are mixed to say the least. However, many young people today may not realize that even after World War I Americans regarded our participation in that conflict with some skepticism. Many regarded our involvement as a concession to financial interests, not necessarily motivated by admirable principles or carried out on the moral "high ground." Sound familiar?

Therefore, during the '20s and '30s, the American public was dubious of war, even though many could see its specter darkening the horizon. This reaction to the war, and the possible effect it could have on national unity during any coming conflict, may have influenced later events, as we shall see.

Despite the inexorable approach of a new war, the U.S. military had been scaled back to a fraction of its WWI strength and its armament was out of date. The development of new weapons accounted for a very small percentage of the total peacetime military budget. Despite this lack of funding, some very important weapons were to appear in time to figure as critical factors in the war.

In the army, with essentially nothing to do, the officers became something of a social club and, with advancement to higher ranks painfully slow, there was little incentive. The main war being fought in the interwar years was a war of funding waged largely between the army and the navy.

Although advancement was slow for regular army officers, the Army Air Corps, reduced from some 20,000 to only 200 at the end of WWI, suffered even greater stagnation. However, members of the air arm were convinced that air



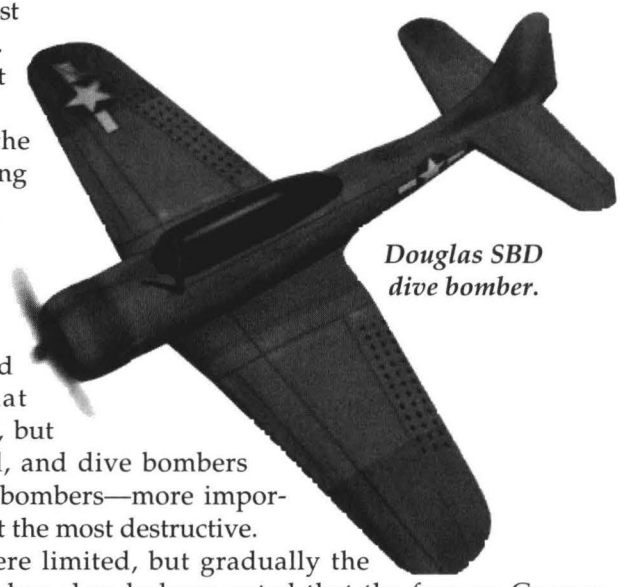
Billy Mitchell—bombing trials.

warfare would play a large role in any future conflict. Led by such proponents as Brigadier General William "Billy" Mitchell, they sought a rearrangement of their position within the military structure and fought a propaganda battle to awaken people to the dangers of a future air offensive.

While Mitchell's well-publicized efforts were eventually to lead to his court martial after he publicly charged "incompetency, criminal negligence, and almost treasonable administration of the National Defense by the Navy and War Departments," others continued to study the problems and devise theories of air warfare. In 1935, the Norden bomb sight made it feasible to conduct the kinds of precision bombing missions envisioned by the American theorists. Precision bombing, according to Ronald Spector in **Eagle Against the Sun**, "was in some ways a characteristically American idea, combining as it did faith in technology, lingering humanitarian concerns, and a taste for clean, decisive solutions in wartime. Instead of indiscriminate night bombings of large areas, precision bombing called for careful selection of targets by thorough analysis of the enemy's economy and war machinery."

The Norden sight wasn't the only critical development of 1935. It was also in that year that Boeing first produced the four-engine B-17 bomber. With its speed (250 mph), its range (2000 miles), and its firepower, it was to prove one of the most powerful weapons of World War II.

From the perspective of the early war in the Pacific, the Douglas SBD "Dauntless" dive bomber was arguably the most important weapon on the American side. Particularly at Midway, this weapon was almost single-handedly able to turn the tide of battle.

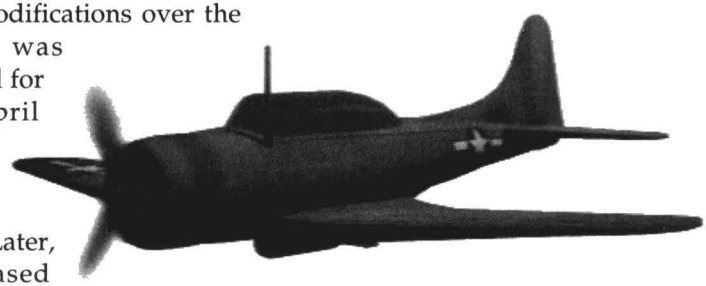


Douglas SBD dive bomber.

The Dauntless was a direct result of the American experimentation with dive bombing which probably began as early as 1919 when Marine aviators tried it. With the commissioning of the first aircraft carrier, the USS Langley, in 1922, it became of considerable interest to find a way to carry some kind of bomb threat aboard the limited confines of a carrier. It was obvious that fighters and torpedo planes would be used, but the need for bombing was also recognized, and dive bombers were the smallest and most maneuverable bombers—more importantly, they were also the most accurate, if not the most destructive.

For years, dive bombing successes were limited, but gradually the equipment and methods were perfected. It has already been noted that the famous German Stuka dive bomber was inspired by the American experiments.

In 1934, the Bureau of Aeronautics announced a competition to design a new generation of carrier planes in several categories. One of the most successful entries was Northrop Corporation's XBT-1. However, in 1938, before this plane could go into full production, John Northrop decided to sell his plant and pass production over to the Douglas Aircraft Company. The principal designer of the XBT-1, Ed Heinemann, stayed on the project. With several improvements and modifications over the original XBT-1, the new XBT-2 was rechristened the SBD-1 (which stood for Scout Bomber Douglas-1). In April 1939 Douglas received their first big order—some 288 Dauntlesses to be split among several services. This was a small peacetime order. Later, during 1942, Douglas had increased production to eleven Dauntlesses a day.



PARALLEL IDEAS

It is interesting to note that, at the time of World War II, most naval experts adhered to theories of naval domination that were not that different from those the air experts were developing. In the methods of the Naval War College (based in large part on the late Nineteenth Century ideas of Alfred Thayer Mahan), the idea was to concentrate battleships and dominate and eliminate the enemy fleet, gaining control of the sea and preventing the enemy's access. The navy could then blockade ports and mount invasions. It was deemed advantageous to provoke an all-out confrontation in which the enemy fleet was destroyed.

Similarly, the theory of air warfare that soon became clear was the need to gain superiority over the area of engagement. For instance, the Germans needed control of the air to mount their Sea Lion against Britain, but were unable to annihilate the RAF and gain that control. They tried to provoke devastating encounters that would cause the British to lose their air force, but were unable to do so. Of course, it is a simpler matter to build another fighter than it is to build a battleship or a carrier. In that equation, the decisive sea battle tends to be decisive for a longer period of time.

As it turned out, control of the air was the most critical factor that determined success in most areas of the war. Even in the Pacific, where great sea battles were to take place, the main elements in many of those battles were the aircraft carriers. In many of the most important encounters at sea, the opposing ships never saw each other at all. Only the airplanes came in contact with the enemy.

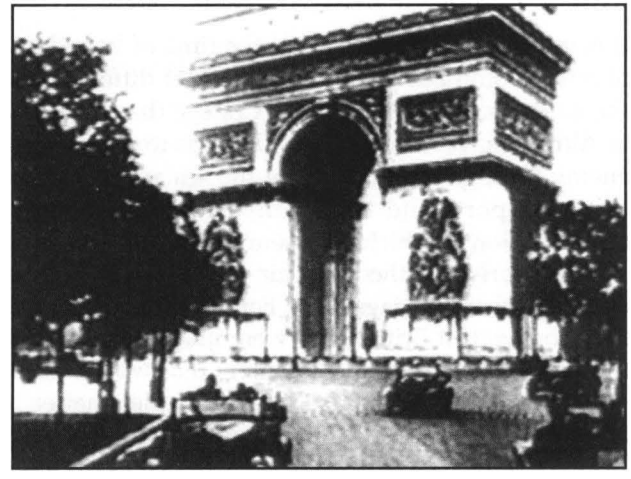
Air cover was important during landing operations, as well, and control of the skies was an decisive factor in the successes of such hard-fought battlegrounds as Guadalcanal, Iwo Jima, and Okinawa.

U.S. STRATEGY

The U.S. leaders had long considered the prospects of war against a variety of countries, and a war plan existed for each. These plans were color coded—red for Great Britain, green for Mexico, black for Germany, and orange for Japan. The so-called Orange Plan existed even before World War I and was revised many times in the years leading up to World War II. There was much discussion and disagreement about the Orange Plan, and one of the most hotly debated topics was the defense of the Philippines. It was generally agreed that the Philippines could not be defended successfully from a Japanese attack, since the enemy could overwhelm the meager American forces stationed there long before the American fleet could arrive. No solution was found to this problem, and it was simply decided that the army must try to control the entrances to Manila Bay and hold out until the fleet arrived.

As the world situation deteriorated, it became clear that the U.S. might have to engage more than one enemy. Thus appeared the so-called "Rainbow" plans. There were in fact five such plans which took into account various combinations of enemies and allies.

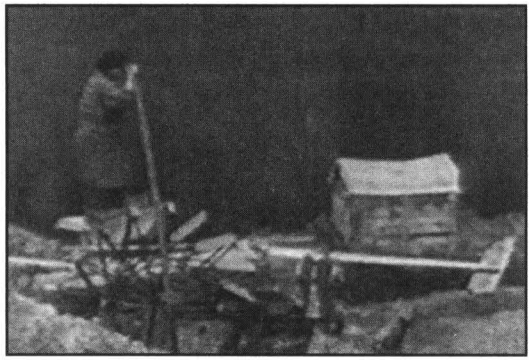
After the fall of France to the Nazis, America seemed suddenly to wake up. Where the Germans had not succeeded in subjugating France throughout the entire years of World War I, they had just done so in 40 days! Only Britain still stood free, and American opinion was that they would not last long. Congress voted incredible appropriations and suddenly the U.S. began to build up its forces and equipment at a frantic pace. Despite the pessimism about Britain's chances, President Roosevelt was unwilling to abandon hope and resisted any plan that wrote them off. He fully expected Great Britain to survive and would not remove American aid. Isolationism was still rampant, however, and many people simply didn't think we had to involve ourselves in a war across the Atlantic. Although there might have been some doubt still as to the American role in Europe, there was no doubt that we had to strengthen our presence in the Pacific.



The fall of France had profound implications.

THE JAPANESE SITUATION

In Japan, in the 1930s, power struggles pitted factions of the powerful Japanese army against each other. One faction favored the rapid build-up of forces and equipment for the concept of "total war." They favored rapid expansion as the answer to Japan's financial woes; the country had been hard hit during the Great Depression. On the other side of the argument were the



The Japanese already had a lower standard of living than those in the U.S. and in Europe, but the Great Depression did not spare them. Here, a woman works a foot-powered water wheel.

traditionalists, the so-called *Kodo-ha* faction, who favored the more spiritual values over the material ones.

One of the pivotal moments in the army's rise to power came when several middle-grade officers manufactured an "incident" in Manchuria which resulted in a take-over by the Japanese and the installation of a puppet regime. This act of aggression was eventually excused by the Japanese government, in effect condoning the army's autonomy since there was nothing convincing about the cover story that supposedly explained the incident. It was, in fact, an act of overt aggression and imperialism. At least that's how the League of Nations saw it, censuring the Japanese, who, in response, withdrew from the League.

Still, the army had to contend with its incompatible factions, and over several years secret plots were periodically uncovered and assassinations were fairly regular occurrences. All this culminated in a coup attempt by the officers of the First Division, traditionalist fanatics who took over government buildings and assassinated several government leaders including Prime Minister Admiral Saito Makoto. They called for a new government, but the Emperor would not back down and called in loyal troops. In a matter of days the rebellion was over. The leaders were quietly tried and executed while other officers with known Kodo-ha sympathies were forced to retire or were transferred to harmless positions. Now the militant proponents of modern warfare were firmly in power and from here led the Japanese to their confrontation with the U.S.

Even these leaders, however, did not rely only on modern weaponry. It was widely believed in Japan that the Japanese fighting spirit and the tradition of Bushido would allow them to prevail even against superior numbers. These beliefs had been proved true in conflicts of the late 19th and very early 20th centuries in battles with the Chinese and the Russians, but the Japanese had yet to experience warfare with modern weaponry. A devastating loss to the Russians in 1939 in the Nomonhan region of Manchuria failed to show them their mistakes, however, and they plunged onward, on a course for war, full of confidence in their superiority. And while

The great Soviet general, Zhukov, handed the Japanese a resounding defeat.

the army sent officers to Germany and the Soviet Union as military observers, they held the U.S. and England in contempt and did not study their methods.

The Japanese navy was more open-minded in their approach and sent officers to study in the U.S. and England as well as in Germany. However, the navy, too, had its factions in the form of the Navy Ministry and the Naval General Staff—two entirely separate entities. While the ministry was responsible for the political side of the navy and the procurement and approval of all construction and other budget matters, the general staff were responsible for fleet operations and war planning.

During the '20s the ministry held most of the power while the general staff grated at the situation. Generally, the officers in the ministry were moderates, favoring a slow build-up and cooperation with the various treaties formed with the U.S., treaties that limited their fleet strength by means of ratios of capital ships.

Officers in the general staff, led by Admiral Kato Kanji, fought a continual battle against these treaties, claiming that they did not allow enough strength to the Japanese fleet. When the moderate Prime Minister Hamaguchi Osachi was assassinated in 1930, the "Fleet Faction," as Kato's supporters were called, began to increase their power and managed to purge the more moderate leaders from the Navy Ministry.

The Washington Treaty of 1922 limited the size of the major navies using a ratio of capital ships (basically, battleships)—5 (U.S.), 5 (Great Britain, 3 (Japanese), 1.75 (France and Italy).

In the meantime, as the Fleet Faction won power, it had to contend with more rivalry—this time from the army whose own ideas of expansion would make it difficult for the navy to get the appropriations necessary to build up the fleet. New arguments arose as to the objective the Japanese should follow. Should they move into the South Seas, obtaining the vital raw materials available in those islands, or should they deal with the threat of the Russians to the north? Obviously, a northern campaign would be carried out predominantly by the army, where the southern campaign required a strong navy which could contend with the expected opposition by the United States and Britain.

In the end, in their "Fundamental Principles of National Policy," adopted in 1936 (though never accepted by the army), they decided to build up a defensive position regarding the Soviet Union while building up the naval strength to be able to secure dominance in the South Pacific. These goals required a large build-up consisting of ten army divisions, additional air squadrons, and two battleships, seven carriers, and twenty destroyers for the navy.

Part of the plan involved persuading China to join in a pact with Japan against Russia, but in that the Japanese failed and full-scale war erupted with China in 1937. Although the Japanese enjoyed great successes in the Sino-Japanese War, they were now involved in a complex situation

The Japanese war with China was just the beginning.

original version of the Japanese plan called for their submarines and land-based aircraft to attrit the fleet in the Gilberts, then the Japanese fleet would complete the job near the Philippines.

The Japanese based their expectation of success on several assumptions: Their men were superior, tougher, and more disciplined—that Japanese fighting spirit again. They would be subjected to rigorous training. And they would have superior weaponry.

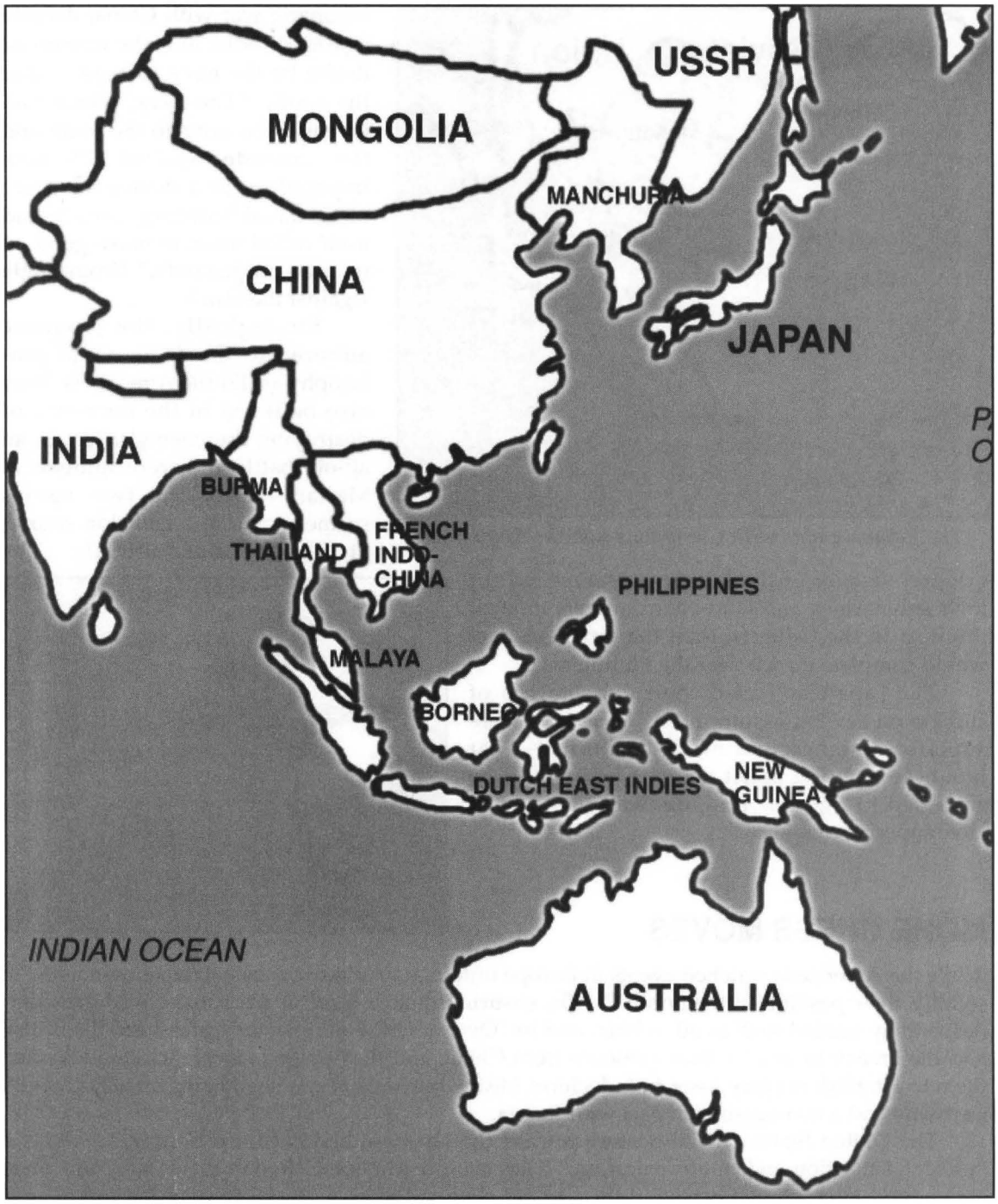
involving war with China, defense against Russia, and the continued desire by the navy to expand into the south. "The navy, which had invented the drive to the south and the crusade against Western imperialism as a device to secure more naval building, now found itself called upon to make good on its own propaganda." (from **Eagle Against the Sun**.)

Strategically, the Japanese adhered to the same naval philosophy as did the Americans. They also believed in the necessity of destroying the enemy's fleet in an all-out battle and were students of Mahan. Thus, the two navies seemed bent on a collision course, at least philosophically. The

MORE CHESS MOVES

While the Americans watched events in Europe unfold at a fantastic pace, the Japanese moved to solidify their position in the South Pacific, ensuring their control of the natural resources they desperately needed such as oil, rubber, and tin. Over a period of time, they pressured the British and the French to remove their presence from China, and they bullied the French into allowing them to establish military bases in Indochina. Meanwhile they began negotiating an alliance with Germany and a non-aggression pact with Russia.

The United States official posture toward the Japanese had been, up to now, to follow a "policy of inaction and nonprovocation." They would admonish the Japanese or lecture them about good international behavior; they would even fail to give official recognition to Japanese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acquisitions in the Pacific, but they would do nothing to provoke a conflict. And even though public sympathy was with China and against Japan, there was an even greater trend of isolationism in the U.S. The public still wanted neutrality, not war.

However, with the new aggressions of the Japanese, especially in Indochina, the U.S. imposed strict embargoes, first on high-grade scrap metal and aviation fuel, and later on all scrap metal. This was a serious situation for Japan, which needed these materials to continue to build its forces.

Japan then joined in the Tripartite Pact with Germany and Italy in which the three countries agreed to assist one another should any of them be attacked by a country not presently involved in the European conflict. Since this pact specifically excluded the Russians, it was clear that the Americans were the expected enemy despite the vagueness of the pact's wording. Opponents of the pact were eventually done away with in typical Japanese fashion (although dissent was probably tolerated better in Japan than in Germany or the Soviet Union at the time).

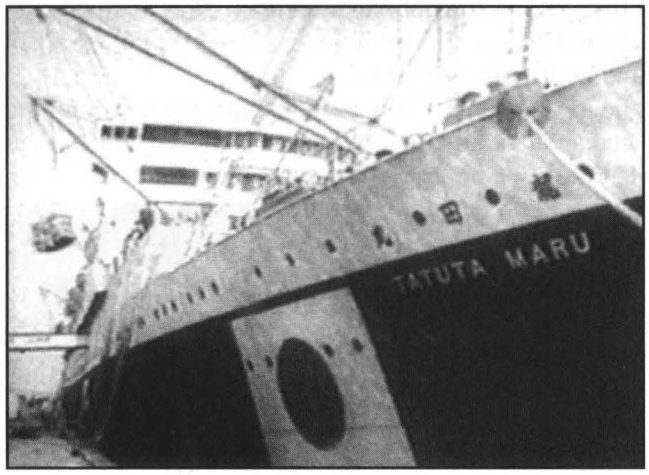
Japanese ambassador, Yosuke Matsuoka with Adolf Hitler.

In America, the choices boiled down to four options as spelled out in a famous memo from Admiral Harold Stark to President Roosevelt. In the memo, Stark pointed out that the U.S. could (a) concentrate on defense of the Western Hemisphere, (b) prepare for all-out warfare in the Pacific while remaining defensive on the Atlantic side, (c) distribute strength equally in the Pacific and Atlantic theaters, or (d) prepare a full attack on the Atlantic while keeping a defensive posture in the Pacific.

Stark expected the fourth option (d or "dog" in military language) to be the most likely event, in contrast with Plan Orange which stressed an offensive counterstrike to expected Japanese aggression. By the beginning of 1941, despite some bickering between the army and the navy, Plan Dog was accepted and approved as policy if and when America did enter the war. Partly because of this policy, and partly because no completely satisfying strategy had been worked out for the war in the Pacific; but primarily because it was felt that only Germany had the potential to win a war, the preoccupation at this time was toward the Atlantic. A series of ineffective negotiations continued with Japan through the summer of 1941.

In July 1941, the Japanese further intimidated the French by moving some 50,000 troops into the southern half of Indochina and bringing their warships into Cam Ranh Bay. Japanese aircraft were now in position as well, and the obvious effect was to bring the Japanese forces within easy striking range of Malaya, the Philippines, and the Netherlands Indies (Indonesia).

Roosevelt's response to this act was to freeze all Japanese funds and assets in the U.S., a move that, while it was not a declaration of war, had the effect of forcing the Japanese into an impossible position. It was not Roosevelt's intention to force the Japanese at this point, and he had allowed for some exports of oil and gas, but his intentions were poorly conveyed to his own



With her credit frozen and embargoes on important resources, Japan was forced closer to war.

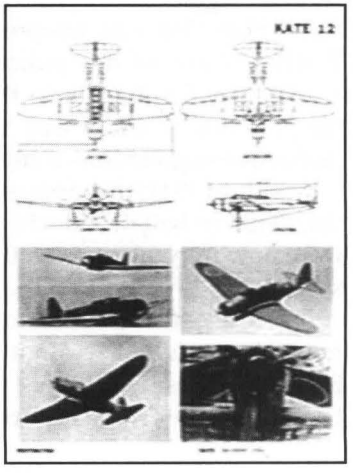
FDR.

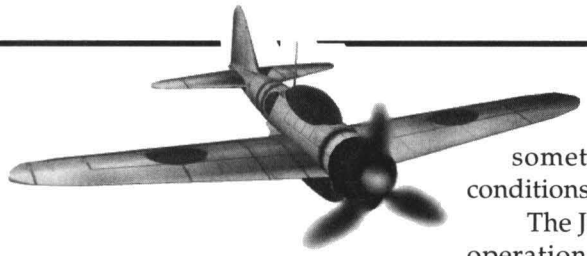
associates, and, while away at a secret meeting with Churchill, government officials rejected all applications for exports of oil and gas by the Japanese. This was a serious mistake, but by the time Roosevelt learned of the situation, it was too late to rescind this decision without seeming to back down on a strong position, so the freeze order stood as interpreted. This meant that the Japanese war machine was in serious trouble. Despite plans to go to war with the U.S., they were dependent on the Americans for raw materials and freezing their assets had tremendous repercussions globally for the Japanese.

Meanwhile Roosevelt recalled the famous and colorful General Douglas MacArthur and put him in command of the Far Eastern forces consisting of combined U.S. and Philippine troops. MacArthur was full of bravado and claimed that he could hold the Philippines if given some support in the form of additional troops and equipment.

WEAPONS OF WAR

One of the Japanese expectations was that they would have equipment superiority in the Pacific. In fact, by the time war did break out, the Japanese had decisive advantages in several areas. Their torpedoes were the best in the world. By 1933, they had torpedoes with a range of up to 24 miles at 39 knots (or 12 miles at 49 knots) which carried very powerful explosives. In addition, the Japanese created ships capable of delivering these torpedoes, including very fast cruisers, excellent destroyers, and large "I"-type submarines with a cruising range of more than 10,000 miles. By contrast, the best U.S. torpedoes as of 1941 had a range of only 4,500 yards, and, as it turned out, even these less powerful torpedoes were plagued with design flaws which made them virtually ineffective.

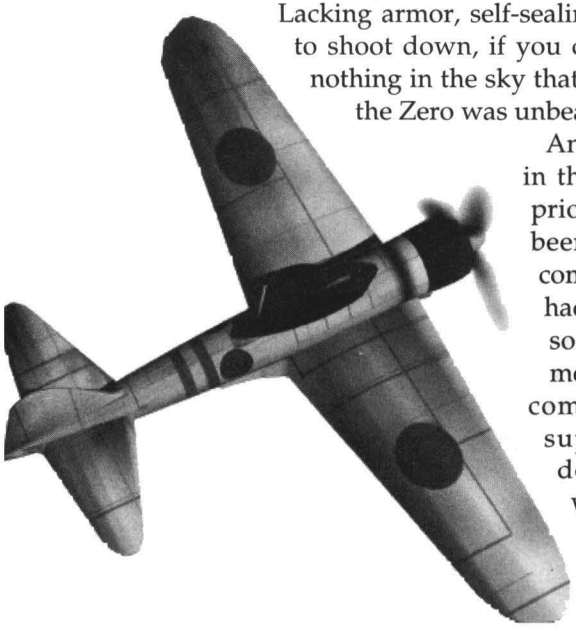




One weakness of the Japanese ship design was that their excessive weaponry sometimes made them unstable in bad weather conditions and several ships were lost in storms.

The Japanese drilled incessantly, especially at night operations designed to get their ships in position to deliver their powerful torpedoes. This night fighting practice, though not without its costs in lives and ships, was to prove a success later in some of the battles against the U.S. naval forces.

The most dominant weapon the Japanese had, however, was the Mitsubishi Zero whose speed, maneuverability, and rate of climb made it the superior of any fighter in the Pacific at the time. With four powerful cannons and additional machine guns, it was extremely capable of knocking its enemies out of the sky. Its only weakness was its vulnerability. Lacking armor, self-sealing fuel tanks, and strong construction, Zeros were easy to shoot down, if you could get a shot. Early in the war, however, there was nothing in the sky that could match the Zero, and in the hands of a good pilot, the Zero was unbeatable.



And the Japanese had some of the most experienced pilots in the world. Like the German Luftwaffe pilots with their prior experience in the Kondor Legion, the Japanese had been trained under battle conditions in China. Their air combat experiences meant that many of their fighter pilots had 700 or more hours of flying time behind them. While some American pilots also had many hours flying time, most did not, and even those who did lacked experience in combat conditions. With a superior fighter plane and superior pilots, the Japanese entered the war with a decided advantage in the air. In fact, in one division which contained some of Japan's leading aces, the Zeros went up time and again against the American forces and came back with no losses while shooting down scores of American planes over a period of several months. This was an exceptional group, but generally the Japanese began on a high note.

But the Japanese military faith in victory at the time rested not on the small, light, and maneuverable Zero fighter, but on the ponderously heavy battleships. They designed and built massive battleships capable of withstanding shells, bombs, and torpedoes while delivering more firepower at longer range than their enemies' ships. Air-minded strategists argued that some of the resources used to construct battleships would be better used to strengthen the air forces and to build more carriers, but most still saw the airplane primarily as a reconnaissance tool, not as a decisive weapon.

Once again, as in the Battle of Britain, the role of air power was to be redefined under combat conditions. Nobody knew how effective aircraft carriers could be, and nobody realized at the beginning of the conflict that the battleship would definitely take a back seat to the carrier as the dominant sea-going weapon.

PREPARATIONS FOR WAR

MacArthur convinced Washington that the Philippines could be held, and planned to mobilize Filipino and American combined troops (200,000 men to defend the beaches at all costs and hold the Philippines). The Filipino troops that did, eventually, go into battle were for the most part ill trained and had, in fact, learned two things only: "one, when an officer appeared, to yell attention in a loud voice, jump up and salute, the other to demand 3 meals per day" (from D. Clayton James, **The Years of MacArthur**, vol. 1: 1880-1940 (Boston: Houghton Mifflin Company, 1970)). Many lacked weapons or even shoes.

However, the army began to mobilize forces and equipment to the Philippines. In the plan, they were to base 300 B-17s there, expecting to bomb enemy fleets far out at sea.

Anticipating the war no earlier than April 1942, preparations were only partly underway by December 1941. Troops were still not trained and fully equipped. Only 35 B-17s had arrived.

Japanese estimates at the time of the economic freeze were that they would have only enough oil for 18 months under war conditions. In other raw materials, the outlook was no longer than 2 years. Despite proposed secret meetings between Roosevelt and Premier Konoye, many military leaders in Japan were convinced that war was inevitable at this time.

Japanese decision making was interesting to note: "When the army and navy chiefs of staff appeared before the Emperor to explain the decisions of the liaison conference, they found His Majesty skeptical. 'Had not the Army promised in 1937 that the China Incident would be settled in a month?' asked the Emperor—yet fighting was still raging four years later. Army General Sugiyama attempted to argue that there was a great difference between war in China with its vast hinterland and attacks on the islands and peninsulas of the Pacific and Southeast Asia. 'If you call the Chinese hinterland vast, would you not describe the Pacific as even more immense?' queried His Majesty.

Emperor Hirohito.

"At this point, the Chief of Naval General Staff Nagano stepped in to explain that the military considered the current state of Japan's relations with the U.S. comparable to a patient slowly dying of a lingering disease. An operation might prove immediately fatal, but if successful it might save the patient's life. The military was anxious for a diplomatic solution; but should this prove impossible, an 'operation' might be necessary.

Nagano's analogy evidently failed to impress the Emperor. At the Imperial Conference held on September 6 to ratify the new policy, His Majesty unexpectedly broke his traditional silence during such meetings to read a poem on the theme of peace composed by his grandfather, the Emperor Meiji, and to express his hopes for peace in his own time. The military chiefs hasted to assure him that every effort would be made to come to a diplomatic agreement, with war to be chosen only as a last resort."

Additionally, time was critical to the Japanese. Their plan to attack Malaysia and the Philippines simultaneously could not be carried out after December when weather and tide conditions would make the attacks too dangerous.

PEARL HARBOR—THE DAY OF INFAMY

The plan for the surprise attack on Pearl Harbor may have originated with Admiral Yamamoto who had consistently opposed the direction the Japanese planners were taking. He had opposed the Tripartite Alliance and was against the idea of a war against the United States. Harvard educated and well travelled in the U.S., he had considerable knowledge of, as well as a great respect for, the latent power of that country. His opposition had put him at some risk of assassination, so, to protect him, his superior, Admiral Yonai Mitsumasa, put him on a ship at sea as the commander of the Combined Fleet. Yamamoto wrote in private to a friend, Rear Admiral Onishi Takejiro, who consulted Commander Genda Minoru, a brilliant young aviation officer. Six weeks later, their assessment that was that it would be difficult, but with the element of surprise, an attack on Pearl Harbor could succeed.

However, this first plan was cut to shreds by Admiral Kusaka Ryunosuke, an experienced carrier commander, and Onishi began to have doubts. Despite arguments from Kusaka that this was too great a gamble, Yamamoto reportedly said that he liked games of chance and insisted that the project continue. He placed Kusaka in charge of working out the details of the plan with his assistants Commanders Genda and Oishji Tamotsu.

Among the obstacles to be overcome were the development of a torpedo that could be effective in shallow water such as was found in Pearl Harbor (this had been done effectively by the British at Taranto in Nov. 1940), and to find a route that would allow six aircraft carriers to approach within 200 miles of Pearl Harbor without being spotted. After such a route was plotted the liner Taiyo Maru sailed along it in October 1941 without sighting a single ship.

In October also, Konoe resigned and General Tojo Hideki became his successor. Tojo was determined to achieve either a diplomatic agreement or war—one decision or the other—in short order.

Tojo.

As December approached, the final plans took shape. The Japanese would attack and occupy all parts of Southeast Asia they did not already control including Burma, Siam (later Thailand), Malaya, the Philippines, and the Dutch East Indies. They would also attack British Borneo and Hong Kong as well as Guam and Wake Islands, both U.S. bases, and would attempt to destroy the Pacific Fleet at Pearl Harbor.

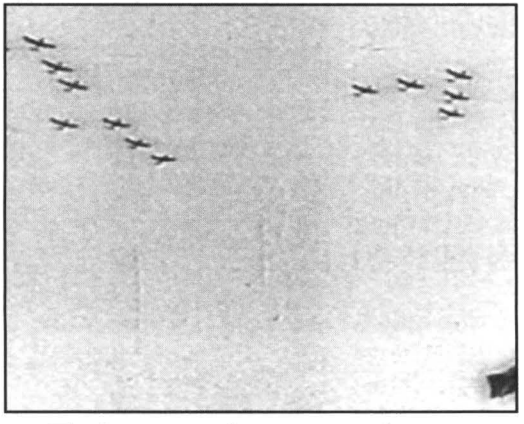
The Japanese were ambitious; that is certain. Their strength at the time consisted of about 700 army combat aircraft and 1300 naval aircraft while a large portion of the army was required in China, Korea, and Japan, and still more troops were needed to defend against any attacks from Russia. Therefore only about 20 percent of

The Japanese air armada getting ready to launch.

The target: Pearl Harbor.

the army's forces were available for the southern attacks. Also, by committing its six major carriers to the attack on Pearl Harbor, the Japanese took them out of the action in the southern areas of conflict. Still, they enjoyed some naval superiority over their enemies in the Pacific, and if the Pearl Harbor attack succeeded, they would have accomplished a major blow to the American fleet and could look forward with confidence to a speedy conclusion of the southern takeover. They expected to overcome the Philippines in 50 days, Malaya in 100 days, and the Dutch East Indies in 150 days.

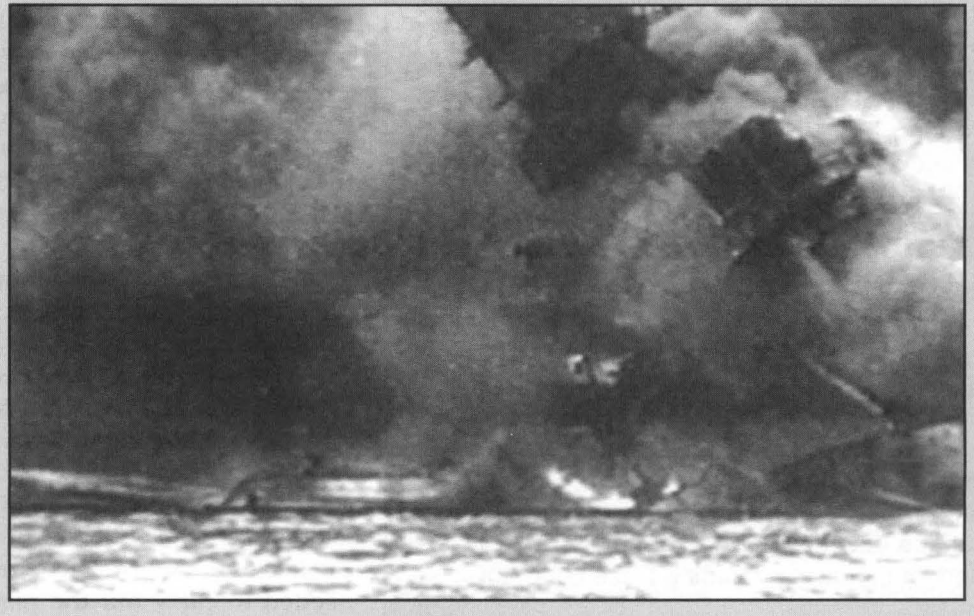
Last minute negotiations in late November failed to produce any agreement, and, on December 4, at a conference in the presence of the Emperor, the decision was made to attack on December 7. Meanwhile, the Americans, who had been monitoring Japanese transmissions successfully since 1940 were aware that the situation had reached a hopeless state and that the Japanese were preparing for war. However, even as late as December 6, Roosevelt was hoping that a direct appeal to the Emperor might still succeed and war could be averted.

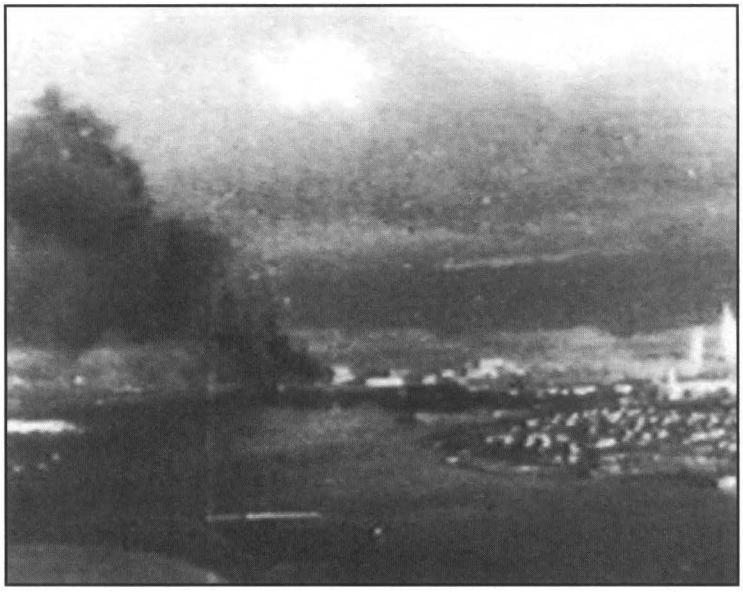


The Japanese planes are on the way.

Even as the president's peace overture went out to the Emperor on December 6, the Japanese attack force prepared to launch their attack. They knew by now that the American carriers were missing, but believed that nine battleships were in port. Actually there were eight. Nobody knew at that time how critical aircraft carriers would be, and it was decided that crippling the battleships would be a sufficient blow. At 6:20 A.M., the first Zero took to the air and the Pacific war had begun.

Destruction at Pearl Harbor





On the success of the Pearl Harbor attack, history shows that it was not an unqualified victory for the Japanese. First, it united the country as no other provocation could have done. A country undivided is a much more formidable enemy. There was no hesitation on the part of the Americans to pour their whole effort into the war in retribution for that sneak attack. Secondly, though the attack did destroy a great number of aging battleships and other naval craft, it did not destroy the critical aircraft carriers that were later to turn the tables on the Japanese. In addition, historians point out that the Japanese failed to knock out critical facilities such as the repair shops and fuel storage as well as the vital logistical departments, which were necessary for Pearl Harbor to remain an effective naval base. However, all this is hindsight. It looked bad enough at the time, and it certainly did more damage to the Americans more quickly than just about any other strategy could have accomplished.

Actually, the brilliant strategist, Genda, had advocated a second attack on Pearl Harbor to take out the American carriers and to finish off the rest of the base, but Nagumo and the other leaders were so relieved and satisfied with their success that they decided not to take another gamble, but to send the vital carriers to the south where they were needed to carry out the rest of the Japanese war plan.

Pearl Harbor Controversy

There are some people who suggest that the Japanese attack was not only expected, but that, in some way, it was part of Roosevelt's plan. This suggestion is based on several somewhat controversial stories. In one, Roosevelt cabled Rear Admiral Thomas C. Hart on December 1 instructing him to charter three small boats to move into key positions along what would certainly be the Japanese attack routes in Indochina. These lightly armed craft would be used as observers. There are those, including Rear Admiral Kemp Tolley who was in command of one of the boats, who contend that this was a deliberate attempt to provoke the Japanese into attacking the boats, providing sufficient provocation for the Americans to enter the war as the Japanese attacked the British and Dutch territories. Even Admiral Hart, in his biography was to support that contention. Although this is not accepted as fact and other authorities dispute it, the uncertainty adds to the mystery of the days preceding December 7th.

More Controversy

There is further controversy over the events immediately prior to the actual attack on Pearl Harbor. The original scapegoats of the debacle were Admiral Kimmel and General Short, and all kinds of stories about the lack of preparedness circulated. Further investigation, while it doesn't entirely release these two from their responsibilities, does show that Washington can take some of the blame as well. Critical Japanese messages, such as one in September 1941 which divided the waters in Pearl Harbor into five areas and others which showed an unusual amount of interest in Hawaii, were never passed on to the commanders of the Hawaiian base, even though they were passed, through normal channels, to other commanders of the Asiatic Fleet. It is easy to see this in retrospect, of course, but at the time, there was a huge amount of background noise and many other messages so that it wasn't necessarily obvious what was important and what was trivial.

Even more critical, perhaps, was the failure of imminent warning to reach the Pearl Harbor base. Colonel Rufus Bratton, the head of the Far East Section of Army Intelligence, had been monitoring the Japanese messages for some time. In the early morning of December 7, a message was intercepted which, among other things, instructed Ambassador Nomura to submit a long 14-part statement to the State Department exactly at 1:00 P.M. The end of this statement was to break off further negotiations. Bratton correctly reasoned that this was no ordinary message. First, the exact time and date the message must be delivered were indicated, which was unusual. Second, since December 7 was a Sunday, it was doubly suspicious. Bratton was convinced an attack was about to take place, though he didn't suspect Pearl Harbor at the time.

However, it took more than two hours to reach Chief of Staff Marshall who was on a horseback ride and could not be reached. Obviously, this was before people wore beepers. Once the situation had been explained, however, a message was sent: "The Japanese are presenting at 1 P.M. Eastern Standard Time today what amounts to an ultimatum. Also they are under orders to destroy their code machine immediately. Just what significance the hour set may have we do not know but be on the alert accordingly." This message was sent to the army commanders in the Pacific with a note to "inform navy." However, the army telegraph wasn't working and the message was sent by commercial telegraph. An offer to use the navy's wireless was turned down. And, furthermore, the message was not labelled with a priority marking, so it actually arrived at General Short's office shortly after the attack had finished.

The fact is that everyone was on alert to a Japanese attack. The problem was that Pearl Harbor didn't seem a likely place to be attacked. Some historians had suggested that Roosevelt did know about the attack and chose to keep the Pearl Harbor commanders in the dark in order to be sure that the Japanese attack took place and the United States would be completely united. However, this is not proven and the majority of historians disagree with that theory. There is no clear evidence that those in Washington had a clear indication that Pearl Harbor was going to be the Japanese target. Even if such evidence had existed, it would have been mixed in with many other messages. There was no shortage of rumor, Japanese communications, and speculation in the days before the attack, and it is entirely possible that accurate warnings could have existed without being singled out from all the false or unimportant intelligence.

Immediately after the attack on Pearl Harbor, the situation in the United States was panicky, especially on the West Coast where fear of invasion was rampant. People in cities such as San Francisco expected Japanese bombs to fall on them at any moment. The panic was not without its humor, however. "In one instance, a dog on a beach on the island of Oahu was reported to be barking in Morse code, presumably to an offshore Japanese submarine."

West Coast air warden.

AFTER PEARL

The Japanese rolled over Guam, but met stiff resistance at Wake Island on December 11 where a handful of U.S. Marines successfully resisted the Japanese attack using their anti-aircraft guns and a few F4F-3 Wildcat fighters. The accurate fire from the anti-aircraft guns damaged and sank several Japanese ships and forced a retreat. However, even as a force was readied to relieve the Marines and to mount a counterattack, hesitation and poor decision making delayed the arrival of carriers and support, and, in a second landing attempt on December 23 were able to establish position. Though the Japanese forces would have been vulnerable to an air attack, and there were two carriers within 450 miles of the island, the decision was made to turn the carriers back to Pearl Harbor and give up Wake since the Japanese had already gained substantial control. The most recent communication from Navy Commander Winfield Scott Cunningham on Wake had stated "The Enemy is on the Island. The Issue is in Doubt." Subsequently, the Marines were forced to surrender and Wake Island was lost. The significance of the loss of Guam and Wake was that the Japanese now had an unbroken line of communications and supply throughout the South Pacific and that left them free to attack the Philippines and other objectives without having to look over their shoulders at American bases in the area.

The Japanese had wasted no time attacking the Philippines. On December 8, they attacked by air and destroyed two squadrons of B-17s and a squadron of P-40 fighters at Clark Field. Another airbase to the west was also bombed and destroyed. Thus, right from the outset, about half of the combat aircraft in the Philippines were destroyed, most of them on the ground. The Japanese were able to perform these raids, against conventional expectations, by modifying their fuel mixtures in the Zeros and by taking extreme measures. Nobody had expected the fighters to make the long flight. Within weeks, the Japanese had invaded Luzon and forced MacArthur and his troops to retreat to the fortress of Corrigedor in a famed march across the Bataan Peninsula where the Americans established a defensive line and endured months of siege.

Although MacArthur had miscalculated and overestimated his ability to defend Manila, he was considered a hero in America. Though he had made many military mistakes, no one could deny

Good to the Last Drop

Saburo Sakai.

Our original attack plan for the Philippines called for the use of three small aircraft carriers to bring the Zeros close to the enemy islands. They were the 11,700-ton *Ryujo*; the 13,950-ton *Zuiho*, a converted submarine tender; and the 20,000-ton *Taiho*, a converted merchant ship. Theoretically the three carriers should have had a combined capacity of ninety fighters, but their actual operational figure was closer to fifty planes, and even this number was halved on windy days. Tsukahara found the three ships almost useless for his purposes.

If, however, the Zeros could fly from Formosa directly to the Philippines and return nonstop, we could then eliminate our need for the carriers. The admiral's aides doubted, however, that a single-engine fighter could carry out a mission of such range. Clark Field was 450 miles away from our own air base, and Nichols Field, another major target near Manila was 500 miles distant from Tainan. That meant, considering the factors of still-air range, fuel for fighting, and fuel for reserve, that we would be required to fly nonstop for some 1,000 to 1,200 miles! No fighters had ever flown on such combat missions before, and there were vehement arguments among the air staff as to whether even the Zero was capable of this performance. There was only one way to determine this point.

From then on we flew literally day and night to stretch the range of our planes. Apart from its range, the Zero was designed to remain in the air on a single flight for a maximum of six or seven hours. We stretched this figure to from ten to twelve hours, and did so on mass formation flights. I personally established the record low consumption of less than seventeen gallons per hour; on the average our pilots reduced their consumption from thirty-five gallons per hour to only eighteen. The Zero carried a normal fuel load of some 182 gallons.

To conserve fuel, we cruised at only 115 knots at 12,000-feet altitude. Under normal full-power conditions, the Zero was capable of 275 knots and, when overboosted for short emergencies, could reach its maximum speed of about 300 knots. On our long-range flights we lowered propeller revolutions to only 1,700 to 1,850 rpm's per minute (sic), and throttled the air control valve to its leanest mixture. This furnished us the absolute minimum of power and speed, and we hung on the fringe of losing engine power at any time and stalling.

These new long-range cruising methods extended the Zero's range by a remarkable figure, however, and our flight commanders reported the exciting news to Admiral Tsukahara, who then dropped the three carriers from his plans. Two of them returned to Japan and one moved on to support our operations at Palau. As a result, the 11th Fleet became a fleet without ships. (from **Samurai**.)

that the American forces in the Philippines continued to resist, even though they had been beaten back, and MacArthur's legend grew. Of course, MacArthur and his staff may have had something to do with this since all official communications referred to "MacArthur's troops" and "MacArthur's men" omitting mention of any other commanders. But with the Japanese enjoying so much success, the American people needed a hero, and, at the time, MacArthur was a likely (and willing) candidate for the job.

The Americans quickly organized their carriers into special task forces. Each carrier had its complement of cruisers and destroyers. The existing battleships (which had sailed over from the Atlantic to replace those lost at Pearl Harbor) were too old and slow to keep up with the carriers and were kept back to patrol between California and Hawaii while the carrier task forces took the war into the Japanese theater.

Admiral Nimitz sent the *Enterprise* and the *Yorktown* out to attack Japanese-held bases in the Marshall Islands. The *Enterprise* then attacked Wake while the *Lexington* went after the Japanese base at Rabaul. In March, the *Yorktown* and the *Lexington* sent planes over the imposing Owen Stanley Mountains of New Guinea to attack Japanese shipping in the Huon Gulf. Flying heavily-laden Devastator torpedo planes, the American pilots couldn't clear the high mountains until one of them, Lieutenant Commander James Brett, a glider pilot, used his knowledge of thermals to find the updrafts along the sides of the mountains and managed to get the heavy Devastators over the top. These pilots were to discover what many others had been discovering up to now—that the torpedoes simply didn't do the job. They would often go too deep and run completely under the target, or, when striking dead-on would fail to explode due to faulty detonators. On the same mission, the Dauntless dive bombers were more successful and claimed four ships with nine others damaged.

The Japanese were concerned about the possible build-up in Australia, but were unprepared for an all-out attack on that target. Hawaii, too, was a desirable target, but too big to attack without the element of surprise, which they didn't figure to enjoy again. However, they saw two key targets which they felt would give them the kind of strategic position they needed. One was Port Moresby on the southern tip of New Guinea, a strategic location for controlling the oceans around Australia and from which attacks on that continent could be mounted. The other key target was Midway Island, a distant member of the Hawaii chain and a key strategic base only 1,100 miles west of the main islands. Though some felt that capturing Midway would be a temporary victory at best, since it was virtually in the American backyard, others, including Yamamoto himself, felt that it would be an opportunity to draw out the rest of the American fleet, and, in accord with Mahan's principles of naval combat, annihilate them in an all-out confrontation.

Meanwhile, Nagumo's fleet, consisting of five large carriers, four fast battleships, three cruisers and nine destroyers roamed with impunity in the Indian Ocean, upsetting the long-standing British dominance there and forcing the majority of the British fleet in the area to withdraw to East Africa.

While the Midway operation was argued heatedly, finally concluding in favor of Yamamoto's plan, then being delayed further while all preparations were made, the famous Doolittle raid on Tokyo shook up the Japanese high command and forestalled any further opposition to the Midway plan.

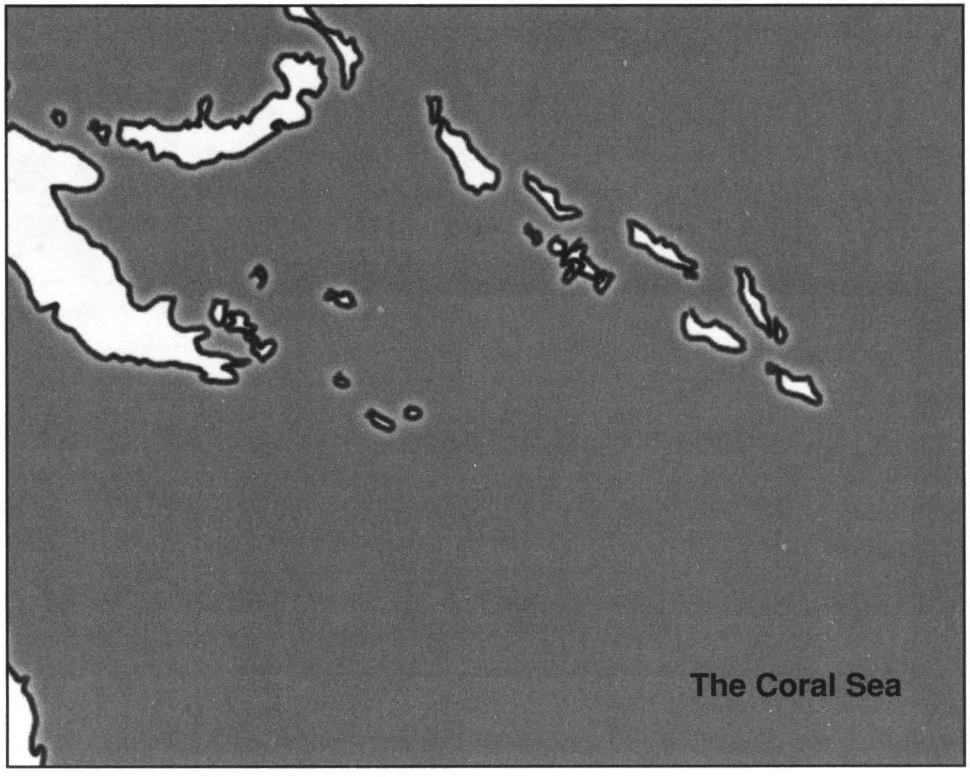
Doolittle's Raid

16 Army Air Force B-25 medium bombers were carried aboard the new carrier *Hornet* to a rendezvous with Halsey's *Enterprise* task force. From there, they headed west toward Japan. Encountering a picket line set up to guard against such a purpose by Yamamoto, the carrier launched its bomber load 150 miles further east than originally planned (650 miles from Japan). With half the American carrier force at risk, it was too dangerous to go any closer. The sixteen bombers, led by Lieutenant Colonel James H. Doolittle dropped bombs with relative impunity over Tokyo and then flew on toward China. Short of fuel, most of the planes were ditched or crash-landed, but 71 of the original 80 men who flew the mission survived.

B-25 taking off from the Enterprise on the Doolittle Raid.

Although the damage done to Tokyo was minimal, the psychological effect was everything the Americans had hoped for. The Japanese high command were both embarrassed and nearly panicky, not having seriously expected counterattacks on the homeland. Yamamoto felt humiliated by the attack—he had failed in his duty to protect the homeland. The preparations for the attack on Midway were expedited and four of Japan's six major carriers began refitting and training for the Midway campaign. Only two carriers were kept in the operations to the south—the *Shokaku* and the *Zuikaku*.

Chapter 10
The Battle of Coral Sea



As part of the New Guinea operations, Admiral Inoue Shigeyoshi had been advocating the seizure of eastern New Guinea and the Solomon Islands. This would simultaneously protect the bases at Rabaul and Truk and strangle the Allied supply lines to Australia. After successfully seizing Rabaul and setting up an air base there, Inoue set his sights on Port Moresby whose strategic importance was recognized by both sides.

The Japanese attack on Port Moresby was divided into several operational groups. It should be noted that this was the standard Japanese *modus operandi,* and led to their suffering disastrous losses again and again throughout the war. Under Rear Admiral Goto Aritomo, the Main Force consisted of four heavy cruisers, a destroyer, and a small carrier—the *Shoho.* The so-called Port Moresby Invasion Force consisted of the troop transports, while the Support Group consisted of a large seaplane carrier, two light cruisers, and other support vessels. Another force, under Rear Admiral Shima Kiyohide, consisted of several transports, destroyers, and auxiliary shipping and was sent to capture the island of Tulagi, one of the Solomon Islands. This island was to become a seaplane base. Meanwhile, the entire operation was to be protected by the Striking Force, which consisted of the *Shokaku* and the *Zuikaku* with two heavy cruisers and six destroyers, all under the leadership of Rear Admiral Takeo Takagi. The main carrier group was led by Rear Admiral Chuichi Hara.

The Japanese plan called for the attack on Tulagi to precede the main attack on Port Moresby. Confident that the Americans were busy elsewhere, especially considering the recent carrier raid on Tokyo, the Japanese expected to use surprise as an element in their quick takeover of these objectives.

However, surprise was not to be one of their assets. Although there had been some problems associated with the decoding of messages around and after the time of Pearl Harbor, delays in disseminating new codes to all the wide-spread Japanese forces meant that the American code breakers had extra time to work on their jobs. Even though they often could only confidently decipher ten to fifteen percent of what they received, it was enough to figure out much of what was going on. In addition, the Americans had employed a technique called radio traffic analysis which, by examining the location and pattern of radio traffic, the Office of Naval Intelligence could piece together important clues about the Japanese activities at sea.

Using radio traffic analysis and cryptography, the Americans knew with some certainty of the presence of the major Japanese carriers in the Coral Sea area and they also knew of the imminent invasion of Port Moresby. Therefore, they sent the *Lexington,* commanded by Rear Admiral Aubrey W. Fitch, from Pearl Harbor to join Rear Admiral Frank Jack Fletcher aboard the *Yorktown* which was already in the Coral Sea. Meanwhile, Admiral Halsey's Enterprise returned to Pearl Harbor after the Doolittle raid and then headed south, though with little hope of reaching the scene of action before it began. MacArthur also sent a small combined force of American and Australian ships under the Aussie Rear Admiral J. G. Crace.

It is clear that Nimitz was attempting to thwart the Japanese advance. It is also possible that he was trying to provoke the kind of confrontation that leads to a definitive encounter (perhaps following the Mahan theories). At any rate, he is said to have been confident of the American superiority both in equipment and in resourcefulness.

Both the *Lexington* and the *Yorktown* task forces stopped for refueling on May 1; and then, on May 2, Fletcher took the *Yorktown* deep into the Coral Sea to begin air reconnaissance. Lieutenant General George Brett's land-based planes (under MacArthur's authority) had reported enemy movements, and Fletcher wanted to get into position with the *Yorktown.* The *Lexington* and the Australian forces under Crace were to rendezvous with the *Yorktown* the next day.

On May 3, the Japanese attacked Tulagi. However, Fletcher learned of the attack and sent his dive bombers against the invasion force. Though American claims were probably

exaggerated, the attack was successful. "Actual Japanese losses were the destroyer *Kikutsuki*, three minesweepers, four barges, and a destroyer run aground. Five floatplanes were also destroyed, in the air and on the water. These losses were nearly inconsequential to the enemy, but served to boost morale among the fliers, who honestly thought they had dealt the Japanese a serious blow."[1] More important than the actual damage done was the fact that the rest of the Tulagi attack vessels were forced to return to Rabaul.

Throughout the night of 3 May, as *Yorktown* approached her launch point for the next morning, air staff and pilots scrambled to assemble as much data as possible on Tulagi. Almost no one had ever heard of it before, and no reliable charts of maps existed. At length somebody found an old issue of *National Geographic* which included some dated photos of the harbor. It was about all the fliers had to go on.

May 6 marked a low point for Americans in the Pacific as General Wainwright, faced with an impossible situation at Corregidor, finally surrendered.

Now Fletcher, after joining up with Fitch and Crace, headed toward the Jomard Passage, a narrow channel through a network of reefs and shallows. This is where he expected the Japanese attack to originate. He also surmised that the major carriers would guard the flanks of the attack forces.

In fact the *Shokaku* and the *Zuikaku* were behind Fletcher to the northeast. In this, the Japanese had an advantage. They were assuming that the Americans would be waiting to the west while the Americans had no idea that the Japanese carriers were behind them. It was May 7 and search planes were flying in every direction. Each commander was now sure that the enemy was near. The object was to find his carriers before he found yours. At least in the beginning, it quickly became a game of mistaken identities.

Early in the morning a Japanese scout plane mistakenly reported a carrier and a cruiser to the south. A major strike force was sent to attack, but found only the tanker *Neosho* and the destroyer *Sims*. Both were attacked and the *Sims* sunk by three direct hits. The *Neosho* took seven hits and was crippled, but remained afloat for four days until some of her crew could be rescued.

Meanwhile, Fletcher received a report of two carriers and four heavy cruisers. Both the *Lexington* and the *Yorktown* launched their planes. However, the "carriers" were actually a couple of old light cruisers and some gunboats from the Support Group. The pilot, in a rush to get his report out and also keep a lookout for enemy planes, had mismatched the sliding portions of his circular code wheel. Later that morning, when the pilot landed back aboard the *Yorktown*, he was able to correct the mistake.

The Americans were in for a stroke of luck, though. On its way to attack this relatively decrepit convoy, one of the bombers sighted the light carrier *Shoho* and its group. Ninety-three American planes attacked, losing only three planes and blasting the *Shoho* into oblivion in a matter of minutes.

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[1] From the Douglas Dive Bomber in World War II

Attacking the *Shoho*

Lieutenant Commander [Bob] Dixon began a high-speed approach of 180 knots while making a gradual let-down to pushover altitude. The ten Dauntlesses turned to the right, following their leader to a favorable attack position downwind and down-sun along the carrier's course.

As Dixon positioned his squadron at 12,500 feet immediately before reaching the pushover point, enemy opposition picked up dramatically. Orange-yellow lights began blinking along the edges of the carrier's flight deck, indicating her antiaircraft guns were joining those of the escorting cruisers. Simultaneously two Zeros began a pass at Dixon's lead section. But it was too late, as at 1105 Dixon came back on his plane's throttle, nosed up and moved the flap selector to open all the dive brakes.

The two Zeros flashed by overhead, thrown off by the SBD's deceleration as Dixon rolled into a 70-degree dive. Other enemy fighters snapped at the rearmost Bombing Two planes, which were still approaching the diving point. But the lead SBD pilots were already lining up the carrier in their sights as they strained forward against their shoulder harnesses, hands and feet gentle on the controls while studying the target through their three-power lenses.

At the time, and for long afterward, *Shoho* was identified as "Ryukaku," a puzzling development as no carrier ever bore such a name, nor did any Japanese warship during World War II. But below Scouting Two's plunging Dauntlesses a Japanese carrier, regardless of her name, was making a frenzied turn to port in hope of evading the bombs which had already begun to fall. And the tactic evidently succeeded as the enemy commander, by turning his ship crosswind, greatly compounded the bombing problem. The carrier offered VS-2 a much narrower target because the SBDs were diving in from one side instead of from astern. In dive bombing, range errors always exceed deflection, especially in a brisk wind. Of the ten 500-pounders dropped by Scouting Two, only three hits were claimed, and of course it is possible that fewer were actually scored. But Dixon's pilots did reasonably well, as at least six bombs were laid close aboard for near misses, knocking five planes off *Shoho's* flight deck. *(Near misses can do a great deal of damage to ships, especially below the water line—Ed.)*

—From The **Dauntless Dive Bomber of World War Two**

Dixon and Scouting Two cleared the area to observe the progress of the attack, for Lieutenant Commander "Ham" Hamilton was maneuvering Bombing Two into position for the heavy blow. *Shoho* was proceeding generally northwest as the scouts approached, and Hamilton had moved to intercept her even while Dixon's pilots were in their dives.

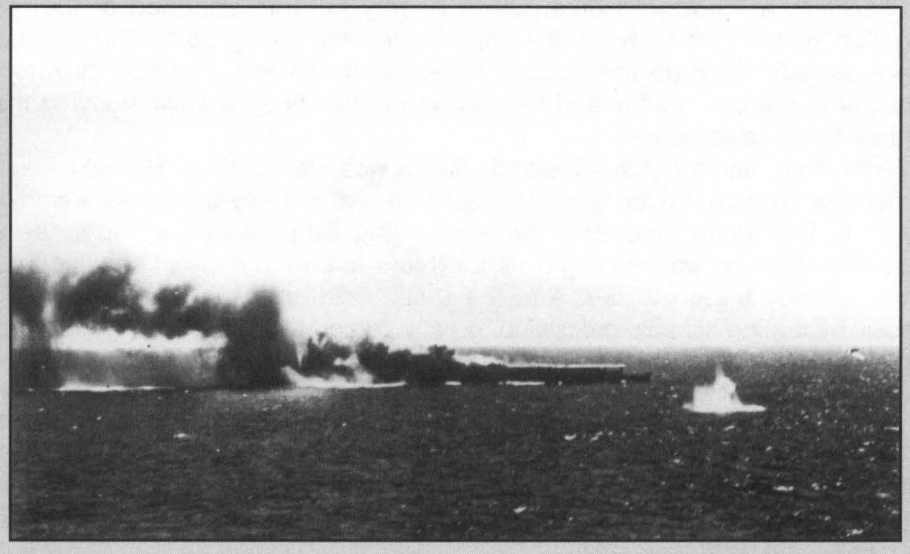
Shoho was just completing her second evasive circle when Hamilton dived. He had a good view of the 11,000 ton carrier, noting she was maintaining a high speed and was apparently not badly damaged; he saw no smoke or flames. As he dived through 2,000 feet Hamilton had everything lined up just the way he wanted. He gripped the black-knobbed manual bomb release with his left hand and, satisfied he could do no better, gave it a good tug. The 1,000-pounder fell away from the SBD's belly, but the abrupt, jerking motion of

Hamilton's left hand caused an involuntary reflex of his right hand, triggering his two .50 calibers. The instantaneous result was a fearsome vibration and rattling of the propeller. The Cyclone engine threatened to shake itself out of its mount.

Hamilton's forward-firing machine guns, normally synchronized to fire through the propeller arc, had slipped out of timing and shot holes in the propeller blades. He quickly throttled back to reduce vibration and turned for home.

There was more than adequate compensation, however, as most of the pilots saw Hamilton's bomb drill straight through *Shoho's* flight deck, aft of amidships. The other 14 Dauntlesses, strung out in a vertical line behind Baker-One, were dropping out of the sky over the carrier. Four more direct hits were claimed, all aft and around Hamilton's, causing a great deal of smoke and flame to obscure most of the ship.

—From The **Dauntless Dive Bomber of World War II**



Mistakenly identified the "Ryukaku," the* Shoho *goes up in flames. The white splash to the right is a torpedo being launched by a Navy TBF.

"I remember my friend Lieutenant Commander Bob Dixon was leading one segment of the attack force. We were out of voice communication with him during the time of the attack and on part of the return trip. But as soon as Bob could get a message through, he called the ship and sent the message that became rather famous: 'Scratch one flattop.'"

—from **The Pacific War Remembered**; Vice Admiral Paul D. Stroop

The rest of the planes from the Lexington *and the* Yorktown *continued to attack the* Shoho *until it slipped under the waves. The whole encounter had lasted 20 minutes. Later, Hamilton got the last remaining propeller aboard the* Lexington.

Although the loss of the *Shoho* was not a major disaster for the Japanese, it did make Admiral Inouye hesitate with his invasion group, thus, eventually, contributing to the successful defense of Port Moresby. But the battle was just beginning. That afternoon, the American planes were back, but Fletcher decided to hold them until the main carrier force could be located. Meanwhile, the Japanese launched attacks on Crace's ships which were without air cover. Flying from Rabaul, land-based bombers and torpedo planes attacked, but brilliant maneuvering on Crace's part dodged several successive attacks, including one by three American B-17s which had mistaken Crace's ships for Japanese vessels. The Japanese pilots reported sinking two battleships and a heavy cruiser, even though Crace's group was untouched.

It didn't get any better for the Japanese at this point. Admiral Takagi's planes, fresh from attacking the *Sims* and *Neosho*, flew out again to launch a night attack Crace's group (which Takagi believed included the American carriers). However, these planes were picked up on the *Lexington*'s radar and were ambushed by American fighters. The Japanese lost nine planes. Several more Japanese planes were lost as they attempted to land on American carriers as darkness and adverse weather conditions conspired to confuse the issue. Fewer than a dozen of the planes Takagi had sent out returned safely.

> No aircraft carrier had ever fought a genuine battle against another. True, Admiral Nagano's carrier-based dive bombers had sunk the British carrier *Hermes* in the Indian Ocean on 9 April, but that was a completely one-sided affair. *Hermes* hadn't even been carrying any planes at the time; they were all ashore on Ceylon. Whatever happened after sunup, the fliers knew, would go a long way toward proving or dispelling so many of the early carrier advocates' theories about naval aviation.
>
> —From The **Dauntless Dive Bomber of World War Two**

If May 7 had been a day of mistaken identities, May 8 was just the opposite. After two days of maneuvering, both carrier commanders were certain that the next day they would meet. At this point the odds were fairly even, at least in carrier terms. Fitch had 121 planes while Hara had 122 (although S. E. Morison reports just the opposite). However, the Japanese had some advantages. First, their pilots were more experienced. Second, during the night, Fletcher had moved his task force south. In so doing he increased the distance between the two adversaries, but he also took his carriers out of the weather line into the clear. Although this meant that the Japanese planes couldn't hide in the clouds, it also made the American carriers extremely visible targets while the Japanese carriers remained partially hidden by clouds and rainstorms.

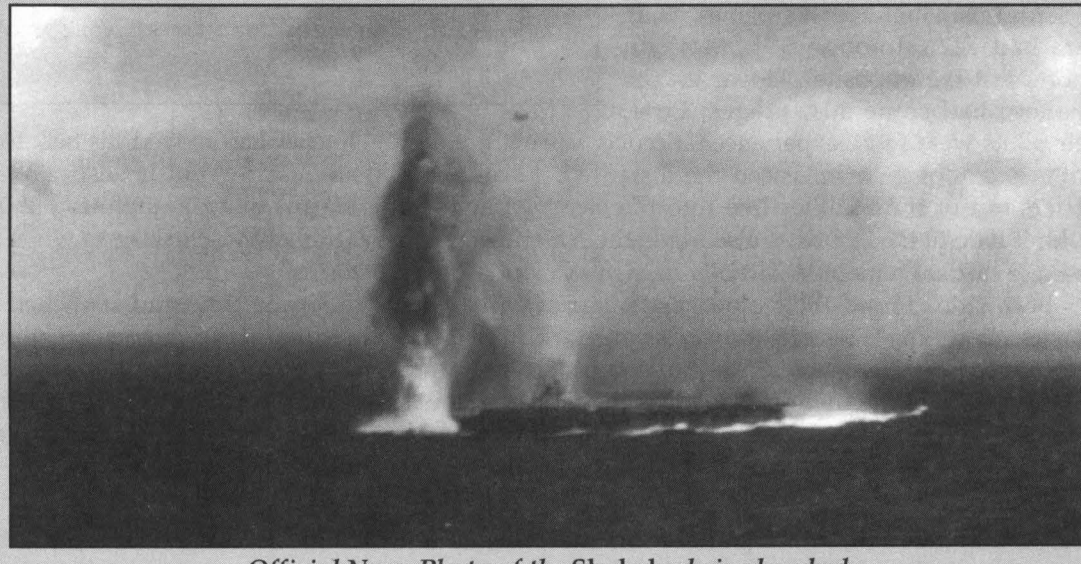
Both sides found their opponent's carriers virtually at the same time and launched air attacks on them. With the *Zuikaku* safely hidden in a rain squall, the American planes concentrated on the *Shokaku*. Despite a concentrated attack, the *Shokaku* was only moderately damaged. One of the main reasons was the failure of the American torpedoes to perform. They were often released too far away from the target or failed to explode when they did hit. In fact, the American torpedoes were so slow that the Japanese ships could actually outrun them.

Weather hampered the attack planes from the *Lexington* as well, and they were unable to contact the enemy. *Yorktown*'s fliers had better luck. The first wave to attack was led by Lieutenant

Attacking the *Shokaku*

The first contact was from Lieutenant (jg) J. G. Smith who sighted the *Shokaku* and the *Zuikaku* at around 8:30 on the morning of May 8. However, his report of their position was partially obscured by radio static, and attempts to reach him failed as his radio receiver unit was inoperative. However his commander, Bob Dixon, was searching the sector west of Smith and had overheard his report. Failing to contact Smith, Dixon headed over to establish and maintain contact with the carriers. It took until 0930 before he could find the carriers and their escort. The weather was deteriorating and Dixon described the hunt as being "like looking for a deer in the forest." His hunt was successful, however, and he maintained contact for more than an hour, slipping through the clouds at low altitude and confronting Zeros from the carriers' CAP. His report back to the *Lexington* stated, "Contact, two CV, two DD bearing 000° distance 160 miles."

"He [Dixon] did a perfectly classic job of shadowing them, taking advantage of cloud cover when he could. I might add that Bob Dixon, in my opinion, was one of the great heroes of this two-day operation. He had led the attack on the Shoho and then did a tremendously fine job of shadowing the *Zuikaku* and *Shokaku* and surviving. This was considered a very dangerous task—to remain in the vicinity of enemy carriers where you could be the target of higher-performance fighter planes. Dixon did it and got away with it. He had been a test pilot and learned early in the game how to economize on fuel and get the most out of an engine. This certainly stood him in good stead that day. When all the search planes came back and Bob Dixon hadn't arrived, we figured that something had happened to him. About an hour after everybody thought he would be out of fuel he showed up over the horizon and landed aboard. He had floated in the vicinity of the Japanese carriers and conserved his fuel." (from The **Pacific War Remembered**.)



Official Navy Photo of the **Shokaku** *being bombed.*

Commander Burch whose group had to fight off attacking Zeros before going into their dives. "Every one of the seven SBDs was hit, five in their fuel tanks, but the self-sealing rubber liners performed as advertised, prevent-ing loss of gasoline and possible fire. Scouting Five gave better than it took, though, claiming four fighters shot down during the dive on *Shokaku*.

"But Burch's pilots were dismayed to find they couldn't get a proper view of the big carrier. With so much moisture in the air and a fairly rapid descent, windscreens and sights fogged over with condensation. The results were predictable and disappointing: no hits."

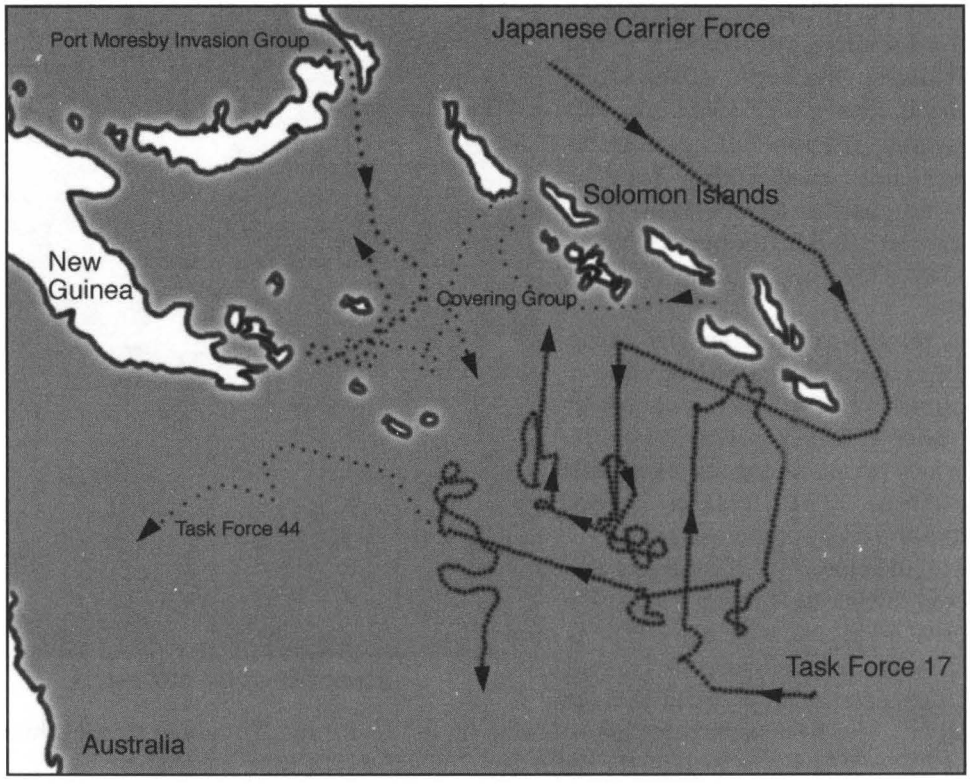
Navy F4F Wildcat fighters.

The night before, one of the pilots had talked about low-altitude bomb release. He believed that taking the dive bomber in as close as possible ensured success. He had stated, "'Remember what they did to us at Pearl Harbor... The folks back home are counting on us. As for me, I'm going to get a hit on a Jap carrier tomorrow if I have to lay it on the flight deck." These words were prophetic.

After Burch's attack, it was Wally Short's turn with 17 SBDs. "Once in their dives, Short's pilots were generally free of fighter attack, allowing them to concentrate on their bombing. But they fared only slightly better than Scouting Five; just one hit of the first dozen bombs dropped. The fourteenth plane was flown by Lieutenant Powers, the squadron's gunnery officer who had vowed to 'lay it on their flight deck' if necessary. The last three pilots in line—Guest, Preston, and McDowell—had a good view of Powers' Dauntless as it was hit repeatedly by AA fire, throwing it off course. But John Powers was a determined individual, and though he radioed he and his gunner were wounded, he rolled the SBD back on target and continued his dive. The plane was afire as it plunged through 2,000 feet, the normal release altitude, but there was no indication of release or pullout. Bombing Five's tail-end pilots watched intently from above, still in their own dives, as Powers continued his descent through 1,500 feet, then 1,000 and incredibly stayed with it at 500. They didn't see how he could possibly pull out.

At the point-blank distance of 300 feet Powers dropped his heavy bomb. The 1,000-pounder splintered *Shokaku*'s flight deck perhaps two seconds before the mortally wounded SBD crashed into the Coral Sea. Powers' friends hoped he'd known at the last second that he'd gotten his hit. One of them said, 'He just decided he wasn't going to miss. And he didn't, God bless him.'" (from **The Douglas Dive Bomber in World War II**.)

One more hit was scored later that morning by Commander Bill Ault's group of four Dauntlesses. However, only one of these planes returned safely. Ault and most of his pilots were lost.



Battle map of the Coral Sea encounter.

Meanwhile, planes from both Japanese carriers attacked the *Lexington* and the *Yorktown*. The CAP (combat air patrol) left behind to protect these carriers consisted of a measly 15 fighters, and these were not well directed so that only two of them even engaged the enemy planes. Some dive-bombers were also sent up, but to no avail.

Seventy Japanese planes attacked without any effective opposition from the carriers and the *Lexington* was hit by two torpedoes on her port side and a direct bomb hit on the main deck. The *Yorktown*, a more maneuverable ship, was able to dodge all the torpedo attacks, but did receive one bomb hit that penetrated down to the fourth deck; the resulting fires were soon controlled.

Although the Japanese pilots reported both carriers as sunk, neither was really out of operation. Even the *Lexington* was able to make 25 knots and could still conduct flight operations. Within an hour after the attack, temporary repairs had been made aboard the *Lexington* and the fires quenched. All seemed well, until gasoline spilled by one of the torpedo hits ignited with a tremendous explosion. Two hours later a second explosion rocked the ship and fires raged out of control. Late in the afternoon, the *Lexington* was abandoned and sunk by one of the destroyers.

The loss of the *Lexington* changed the odds considerably, and Fletcher decided to withdraw at that point. With only forty planes and believing that he faced at least two, possibly three Japanese carriers, he had no choice. The Japanese, however, were not in much better shape. The

We learned that our ships were tinder.

The Attack on the Lexington

Vals on the prowl.

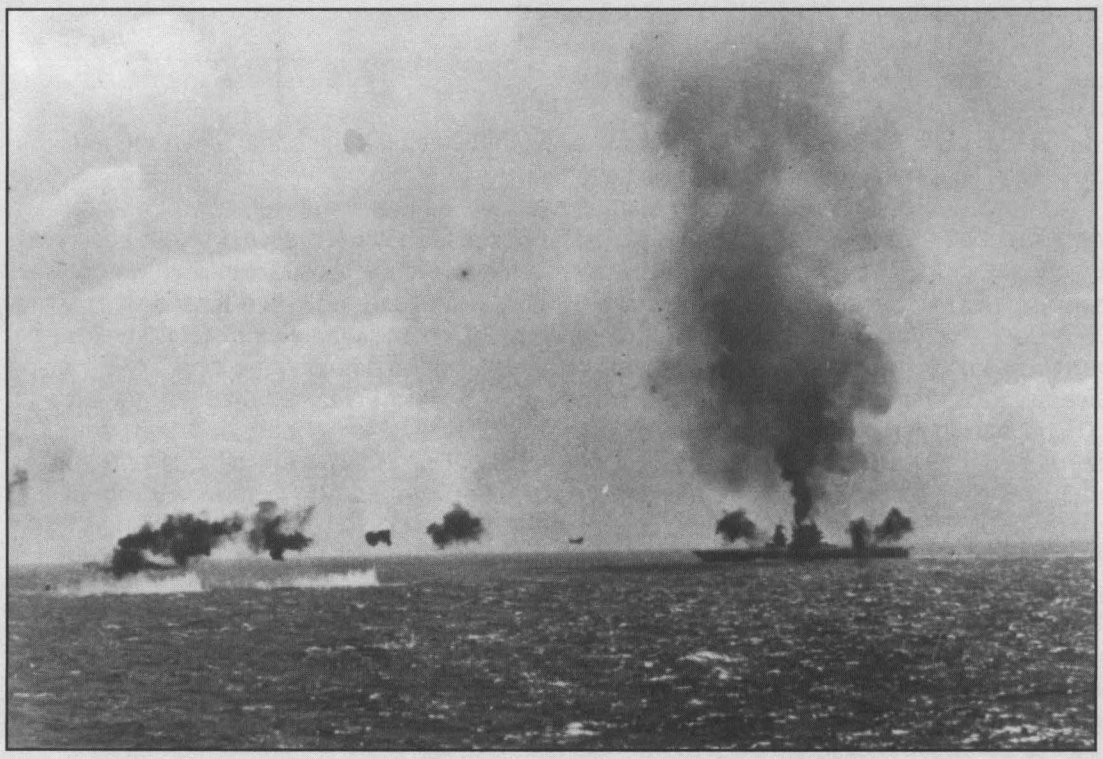
"I can remember standing on the bridge and watching the dive-bombers come down. These had fixed landing gear. You were convinced that the pilot in the plane had the bridge of your ship right in his sight. You knew it and it didn't look good. Fortunately they were not strafing, because if they had been I'm sure they would have made topside untenable. The minute the pilot released his bomb you could see it taking a different trajectory from the aircraft itself. Generally it fell short, because their dive wasn't quite as steep as it should have been, and you knew that particular bomb wasn't going to hit you. It might hit the side of the ship. I was fascinated watching the bomb leave the airplane and realizing it was probably going to fall short.

"The torpedo planes came in about the same time in a fine, nicely coordinated attack and launched their torpedoes at about a thousand yards. They were down to flight-deck level when they dropped the torpedoes. And of course they were successful. I believe we got four torpedo hits. In the official account that was finally sent out, only two torpedo hits were recorded. I personally believe this was wrong. The Lexington probably took four. I believe all the torpedo hits were on the port side and pretty well distributed along the length of the ship, because immediately after the attack we took a port list and I watched some of the torpedo planes passing from port to starboard. They'd launch their torpedoes, and then some of them would fly very close to the ship to get a look at us. They were curious and sort of thumbed their noses at us. We were shooting at them with out new 20mms and not hitting them at all. The tracers were falling astern of the planes. It was very discouraging to see enemy planes pass within range of your guns and not be able to knock them down. You had some personal interest in what they were doing and you were scared, all at the same time. As far as the senior people were concerned, we were completely helpless. We were depending on the training that had been given the fighter pilots in the air and on the training and practice the gunners had. The commanding officer of the ship, Captain Frederick C. Sherman, was very busy twisting his ship, trying to avoid torpedoes. I think he was successful in some cases.

"I think the Lexington took three bomb hits. One of the most spectacular was on the port gun gallery. A bomb exploded and immediately burned and killed gun crews in that area. I remember walking down there when the attack was over and there were the marine gunners, burned right at their stations on the guns. That particular bomb started a fire down

in the officers' country, the next deck below. The living quarters were set on fire and a couple of stewards who were down in the pantry were killed. I remember that particularly, because I considered going down later and getting into the stateroom and taking out some gear from the safe. It couldn't be done. We had another bomb in the after part of the island or stack and another one aft in the boat pocket where the captain's gig was stored. All these bombs started fires which we figured we could control and put out.

"We learned a lot from this action. We learned that our ships were tinder. They had too much flammable stuff aboard. The furniture in the admiral's cabin, for example, was wood and fabric. That burned. Paint all over the ship had an oil base, and wherever we got a fire the paint on the bulkhead burned. That had to be corrected. We learned that our fire-fighting equipment was not adequate, that we needed to redesign our hoses and hose nozzles for fog instead of solid water." *(The lessons learned on the* Lexington *were critical to the later survival of American ships for the rest of the war—Ed.)*



A Japanese plane (just above the horizon, left center) "hedge hops" over anti-aircraft bursts as it closes in to attack the **USS Lexington.** *The white spray in the left foreground was whipped up by automatic anti-aircraft gun shells hitting the water and exploding. Off to the right a black puff of anti-aircraft smoke indicates that another Japanese plane was coming in from that direction.* **Official Navy Photo.**

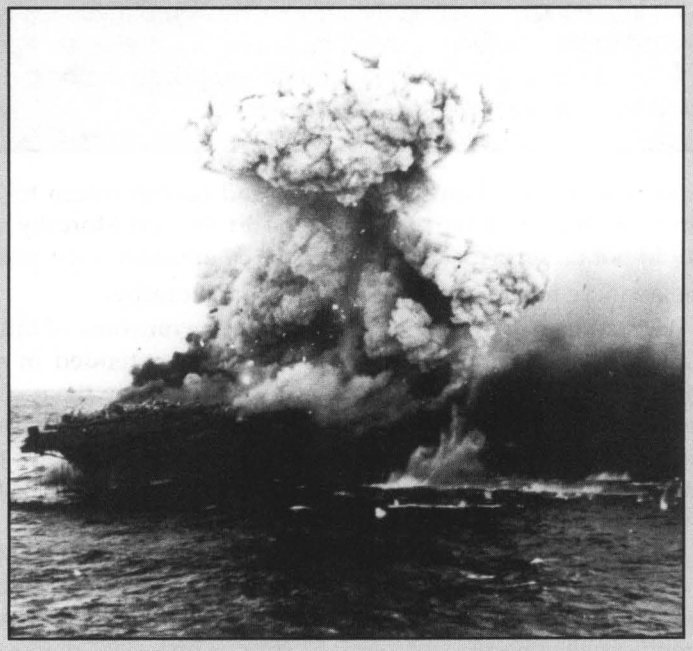
The Loss of the "Lady Lex"

"Along about two or two-thirty in the afternoon we heard a rather loud submerged explosion. My first reaction was that a Japanese submarine had sighted us and fired a torpedo which probably had an influence fuze and had gone off under the hull. It seemed like that kind of an explosion, deep down and probably under the ship. We found out later that it was not an enemy torpedo at all. It was gasoline fuel. The bomb hits had caused the fuel to leak. It had collected in the elevator well and some spark had set off the fumes. The immediate effects were disastrous. As soon as the explosion occurred communication between the bridge and central station was lost. (Later testimony showed that Pop Healy [the damage-control officer] and his crew were in central station and were wiped out at that time.) Fires throughout the ship were accelerated by the explosion. Another fire developed underneath the number-two elevator. The elevator was flush with the flight deck and you could see the flames coming out. Word came almost immediately that the engineering spaces were untenable and had to be abandoned, so the engineering crews on the afternoon watch shut down the main engines. Here was the ship dead in the water and, worst of all, she had no fire-fighting capability. All power was lost. From then on the case was hopeless. We actually had a destroyer alongside to try and get hoses over, but this was completely impractical. The fires kept increasing in size, and by three o'clock the decision was made to get the wounded off the ship and the air group personnel as well....

"....We continued trying to fight the fires, but it became increasingly evident that the ship couldn't be saved. It was also evident that staying aboard much longer was very dangerous.

"Apparently on the hangar deck torpedo warheads were going off from the storage aft. Flames were erupting with increasing frequency around the perimeter of the elevator. They would shoot up two or three feet. They sounded like a freight train rumbling up the hangar deck.

"Finally Admiral Fitch, in order, I think, to ease the captain into making the proper decision, said, 'Well, Fred, I think it's about time to get the men off.'"



Leaking fuel caused the major explosion that spelled the end of the **Lexington. Official Navy Photo.**

Facial Hair and the *Lexington* Attack

"Late that afternoon, after our planes had got back from their attack on the invasion force off the New Guinea coast, we began getting indications on the radar screen of unidentified aircraft in the vicinity. With that we put fighters in the air and vectored them out. The fighters from the *Lexington* were led by Lieutenant Commander Paul Ramsey. According to his story, he came out of a cloud deck and under the clouds he found a formation of Japanese attack planes. Apparently they had been sent in our direction and had not found our carriers. He came out behind them and was in perfect position. Immediately he was able to shoot down the last two planes in the Jap formation. I remember when Ramsey got back to the *Lexington*. During our trip south from Pearl Harbor he'd grown a luxuriant mustache. He said that as soon as he shot down his first Japanese plane he would shave this mustache off. When he approached the *Lexington* he made a quick circle around the ship with his canopy open. He was stroking his mustache, indicating that he wasn't going to have it much longer. And he landed aboard and shaved it off that night.

"All of this made it obvious to us and to the Japanese that we were quite close to each other that night and would probably have an engagement the next day. I think the record shows that the Japanese carriers went north during the night and the *Yorktown* and *Lexington* went south, getting prepared for the next day's operations.

"I went to sleep that night but I wakened early. I remember I had to get up in a hurry when a bundle of intelligence dispatches were made available to me. It was probably three-thirty in the morning. I didn't have time to shave, so I put my electric razor in my pocket thinking I would have some time on the bridge the next day. I never had that opportunity. I still had the razor when I abandoned ship."

Shokaku had been damaged severely and had to return to Truk for repairs. That left only one carrier with about forty planes to support the Port Moresby invasion. Admiral Inoue felt that this would not be sufficient and withdrew the invasion force, postponing the attack. As it turned out, the Japanese never returned to attack Port Moresby.

Weather played a significant part in the outcome of this first all-carrier battle. Looking on a map of the action, the main heavy weather extended in a band across the area. During the engagement, the Japanese carriers were both within the heavy weather area while the American carriers remained in clearer weather. This made it easier for the Japanese to find the American carriers, and all the harder for the American attack planes to locate their targets. Although not much has been made of it when analyzing the Battle of Coral Sea, weather was clearly an important factor to consider in any air combat engagement.

Both sides were able to count this as a victory. The sinking of the *Lexington* more than offset their losses, and they maintained that the encounter was a success for them. In fact, Yamamoto believed that both American carriers were either sunk or severely damaged. However, from the American viewpoint, and perhaps from a historical perspective, the Battle of Coral Sea was a decided victory for the Allies for two main reasons. One, the Port Moresby invasion was beaten back. This was the main objective of the Allies. As it turned out, it protected the Australian area and caused the Japanese advance to grind to a halt, at least at this point.

The second reason to view the Coral Sea battle as an Allied success requires hindsight. Because of damage suffered during the engagement and because of the loss of aircraft, neither the *Shokaku* nor the *Zuikaku* were ready to participate in the Battle of Midway where their additional strength might have proved decisive while the *Yorktown* was able to participate. In retrospect, this was a loss of incredible importance to the tides of the Pacific war.

Notes from Admiral Frederick C. Sherman, Captain of the Lexington

The Admiral notes that this was the first carrier duel in history, and the deployment of the fighter CAP was based on expectations that the torpedo planes represented the greater threat to the ship. With early radar detecting the enemy at 68 miles, but offering no information about their altitude, some planes were kept at 10,000 feet while the Dauntless dive bombers were maintained at 2,000 feet about 6,000 yards from the Lex. In retrospect, the Admiral observed that interception should have taken place at a greater distance from the ship, but such observations came too late to save the 'Lady Lex.'

"As I saw a bomb leave one of the planes, it seemed to be coming straight for where I stood on the bridge. Had I better duck behind the thin armored shield? If it had my name on it, I thought, there was no use dodging, and if not, there was no need to worry. At any rate, I had work to do to try to evade the torpedoes."

"The ideal way to drop torpedoes was for groups of planes to let go simultaneously on both bows. In this method, if the target ship turned toward one group to parallel its torpedoes, it presented its broadside to the other. The timing was vital. The enormous Lexington was very slow in returning. It took 30 to 40 seconds just to put the rudder hard over. When she did start to turn, she moved majestically and ponderously in a large circle. Maneuverability was greatly improved in later carriers."

"Enemy planes were being shot down right and left, and the water around us was dotted with the towering flames of their burning carcasses. One plane turned upside down as it hit the water, its torpedo still slung on its belly. Before it sank, we noticed a peculiar wooden framework around the missile's nose and propeller mechanism. This explained why the Japanese were able to drop their torpedoes at such high speeds and altitudes. The cushioning devices permitted them to enter the water without excessive shock to the delicate machinery."

Admiral Sherman watched the evacuation until all the crew had safely abandoned the doomed carrier. He ordered the last man to leave the ship "as it was my duty and privilege to be the last one to go. He went down into the water. I stood on the great ship alone.

"While I was pausing there, a tremendous explosion took place amidships by the elevator. Planes and debris of all kinds went high into the air. Ducking under the edge of the flight deck to avoid the falling pieces, I decided it was time to go, and slid down the rope to do my stint of swimming until my turn came to be picked up by the rescue boats." (from **The Pacific War Remembered**.)

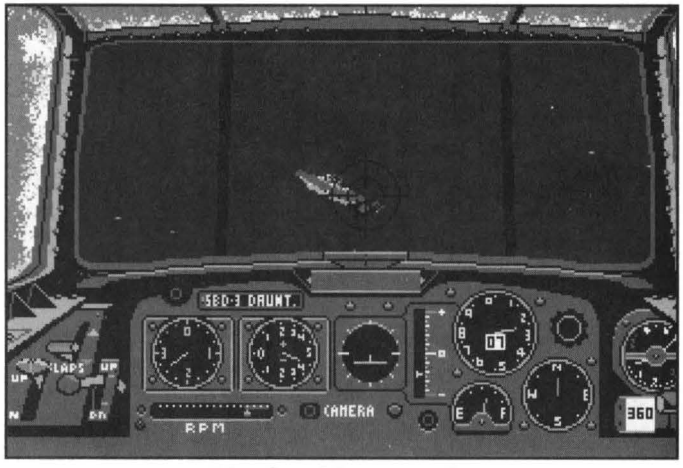
CORAL SEA MISSIONS

US CORAL SEA #1

Join a dive bombing attack on the *Shoho*, a Japanese light carrier. Sink it and you may prevent the invasion of New Guinea.

Difficulty: Easy

Strategy



Dive bombing a carrier.

You start at 15,000 feet following two other Dauntless SBD-2s to the target, the light carrier *Shoho*. The carrier is directly in front of your group. As you approach the carrier three Zekes will appear and fly past your group. Make sure you are flying straight and level, and jump in the rear gunner's seat to shoot the attacking Zekes.

Once you hear the anti-aircraft fire from the enemy ships, jump back into the pilot's seat and begin your dive bombing attack on the carrier. Line up the ship in your gun sights and extend the dive brakes. Release your bomb at 2,000 feet and pull out at 1,000 feet, retracting your dive brakes and increasing your RPMs to 100% in the process. Follow the remaining wingmen for protection. You can choose between dogfighting the remaining Zekes or maintaining level flight and shooting them down from the rear gunner's position. Once the Zekes are killed the mission ends.

JAPAN CORAL SEA #1

Protect your light carrier, the *Shoho*, from attacking US dive bombers. The *Shoho* must survive to lead and protect the Port Moresby invasion force.

Difficulty: Hard

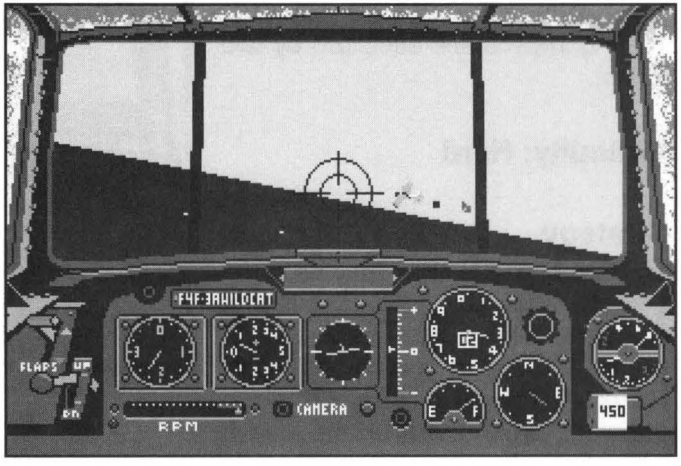
Strategy

You start at 15,000 feet heading towards two groups of Dauntless aircraft which consist of 3 planes in each group. Approach the first group head on at 100% RPM. Once you can

see enough detail on the planes, line up your gunsight on the flight leader and shoot your 20mm cannon at him. Once the group passes you, reduce altitude slightly and turn 180 degrees to shoot again at the group with your 20mm gun. You should be slightly below the group to avoid the rear tail gunner of the enemy plane. If you're unable to shoot down all of the Dauntlesses, carefully follow them into the dive at an angle to avoid the rear gunner. Watch your altitude. Climb back up to 15,000 feet and use the same tactic to intercept the second wave of dive bombers.

US CORAL SEA #2

Escort dive bombers on their attack against the carrier *Shokaku*, part of the Japanese Carrier Strike Force trying to gain supremacy in the Coral Sea.



Use deflection shooting against the Zeros.

Difficulty: Moderate

Strategy

You start at 10,000 feet escorting two SBD's for an attack on the *Shokaku*. There are two groups of Zekes consisting of two planes each. The first group will attack head on from the left. Aim for the flight leader and begin firing. As he passes, follow him. He will turn 180 degrees and attempt to shoot down the SBDs from behind. The other group of Zekes should also be behind the SBDs. Use your dogfighting skills to attack them as they try to maneuver into position behind the SBDs.

JAPAN CORAL SEA #2

Shoot down incoming dive bombers and fighters before they get to your carrier, the *Shokaku*.

Difficulty: Moderate

Strategy

You start at 15,000 feet approaching two groups of aircraft. The first group consists of a Wildcat fighter, that is flying at 15,000 feet, and two Dauntless dive bombers flying at

about 11,000 feet. Ignore the Wildcat and dive on the two dive bombers head on. Turn 180 degrees and continue attacking the dive bombers. Your wingman will attack the fighter. Once the dive bombers have been destroyed, use your dogfighting skills to destroy the second group of aircraft which consist of two Wildcats.

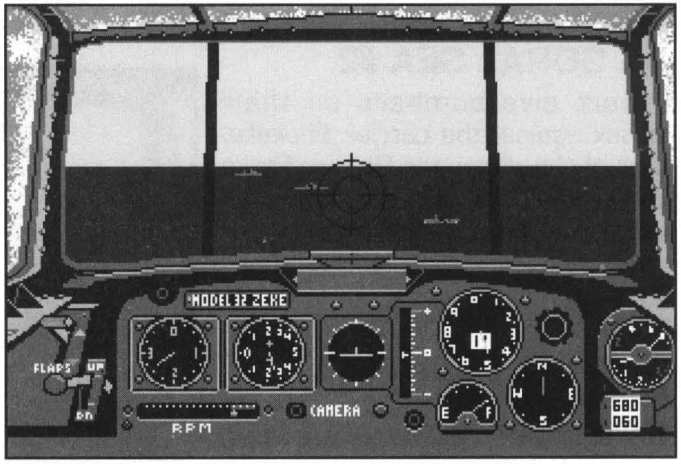
US CORAL SEA #3

The Japanese attack planes have sighted your task force! Defend the *Lexington* from torpedo attack. Their bombers are escorted by two Zekes.

Difficulty: Hard

Strategy

You start at 10,000 feet with the *Lexington* to your right. The target aircraft, four Kates, are bright green and below you to the right. Bank right, and line up your gunsight on the rear Kate of the formation. As you approach, begin shooting. Once the rear one has been destroyed, continue shooting the rest of the Kates in the formation, from the rear. Ignore the Zekes, and concentrate on the Kates. Once the Kates have been destroyed, use your dogfighting skills to take out the remaining Zekes.



The safest approach is head-on.

JAPAN CORAL SEA #3

You have a great opportunity to deal a heavy blow to the U.S. carrier air power. Fly your Kate torpedo bomber in an attempt to sink the *Lexington*.

Difficulty: Easy

Strategy:

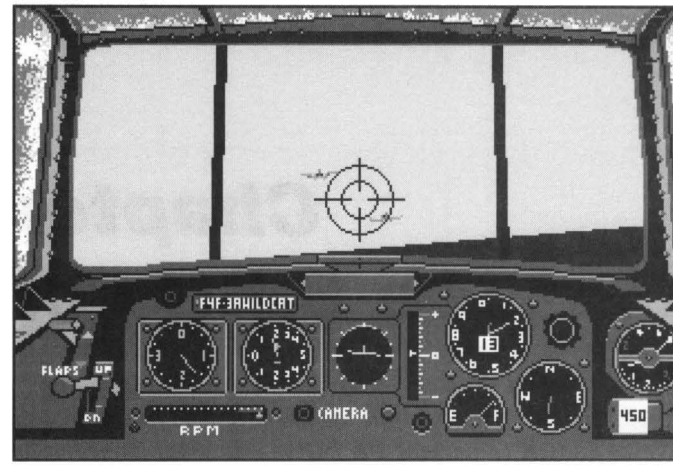
You start at 5,000 feet heading straight for the carrier in the distance. Maintain level flight and man the rear gunner position to fight off the Wildcat fighter. As soon as your Zeke engages the enemy fighter, jump back into the pilot's seat and begin your attack run. Once your torpedo is released, turn 180 degrees and rejoin the rest of your formation. Keep your altitude low, and avoid the flak.

US CORAL SEA #4

Defend the *Yorktown* a from dive bombing attack. Several waves of Vals from the *Shokaku* and the *Zuikaku* are poised for attack. It is vital that the *Yorktown* survive!

Difficulty: Hard

Strategy:



The best approach is from below and behind.

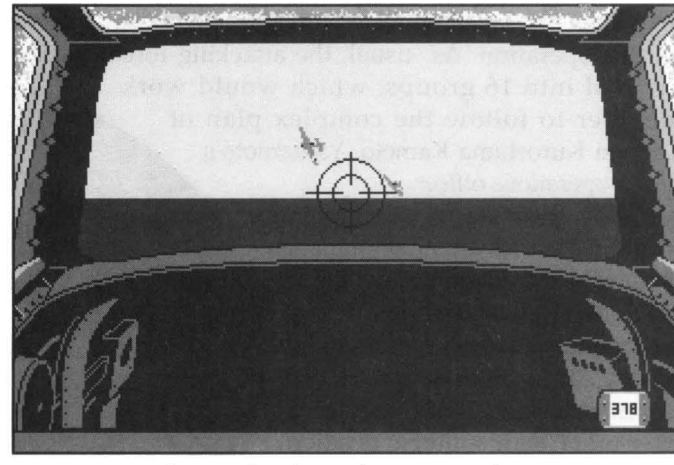
You start at 15,000 feet. Three groups of Vals, consisting of four planes each are approaching directly in front of you. Use your dogfighting skills to take out the Vals before they begin the dive bomb attack on the carrier which is behind you. Once they begin their dive, you'll lose precious altitude if you follow them. This is not recommended. Victory in this mission depends on taking out the Vals early with accurate shooting and maintaining your altitude to take on the remaining waves.

JAPAN CORAL SEA #4

The *Lexington* is damaged and burning. Now concentrate on the undamaged *Yorktown*. If both are out of commission then New Guinea and possibly Australia can be conquered. Not only that, but without the *Yorktown*, the Battle of Midway could very well go to the Japanese.

Difficulty: Moderate

Strategy:



Watch your back on the way to the target.

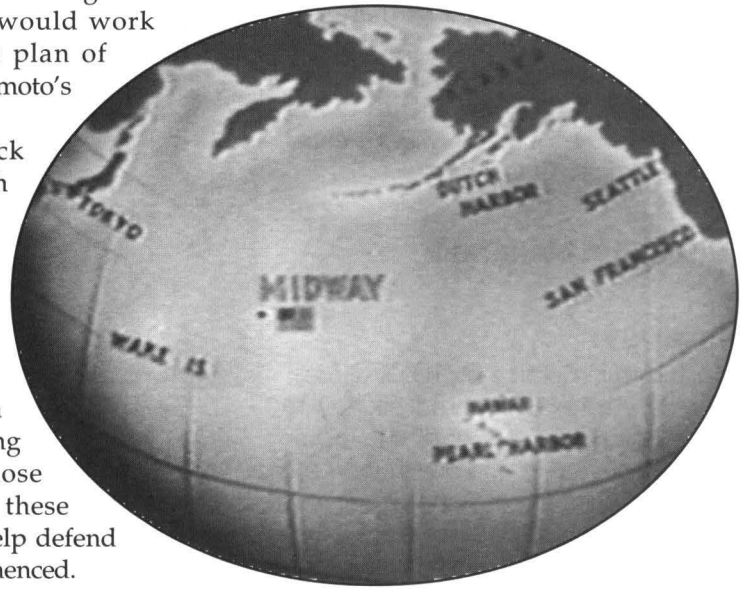
Your mission starts at 10,000 feet. The *Yorktown* is located slightly to your left. Turn left until the other aircraft of your group are in view and are directly in front of you. Maintain level flight and man the rear gunner seat and shoot down any attacking Wildcats. Once you hear the AA flak and the bombs hit the carrier from your group, return to the pilot's seat and begin your dive bomb attack. Use your dogfighting skills to destroy any remaining Wildcats hounding you.

Chapter 11
The Battle of Midway

Much has been written about the Battle of Midway, perhaps the most significant battle of the Pacific war. We've chosen to present the battle primarily from the perspective of those who participated in it. Throughout this chapter, you'll find first-hand accounts of some of the people who experienced this battle.

Believing as he did that both American carriers had been destroyed or at least crippled in the Coral Sea, Yamamoto felt that his four operational carriers would be sufficient to do the job at Midway. Therefore he didn't wait until the *Zuikaku*, recently involved in the Coral Sea battle, could be repaired and refitted. (The *Shokaku* could not have been repaired in time.) The Japanese were brimming with confidence as they approached the Midway operation. They were sure that American losses had sapped their will to fight. In addition, their war games rehearsals had all indicated a decisive victory.

Thus, the Japanese were willing to risk most of their navy on this operation. As usual, the attacking forces were divided into 16 groups, which would work together to follow the complex plan of Captain Kuroshima Kameto, Yamamoto's senior operations officer.



The first stage of the attack would feature an air strike on Dutch Harbor in the Aleutians, far to the north of Midway. Following this, the Japanese auxiliary forces would occupy Attu and Kiska islands, two frozen wastelands with nothing to offer other than strategic position, and that position a questionable gain at best. Perhaps they were thinking that the American aircraft on those islands would be neutralized by these attacks and would be unable to help defend Midway when the main battle commenced.

The day after the Aleutian attacks, the main strike force would move on Midway. The four carriers under Admiral Nagumo would attack from the northwest, and, the following day, Vice Admiral Kondo Nobutake's Second Fleet with two battleships, a small carrier, and several heavy cruisers would escort the invasion convoy from the southwest to take over Midway. Meanwhile, Yamamoto would remain several hundred miles to the west with the three newest battleships, four older ones, and a small carrier, ready to take on the American fleet as it moved toward Midway from Pearl Harbor. In addition, submarines would attack the Americans as they steamed out of Pearl.

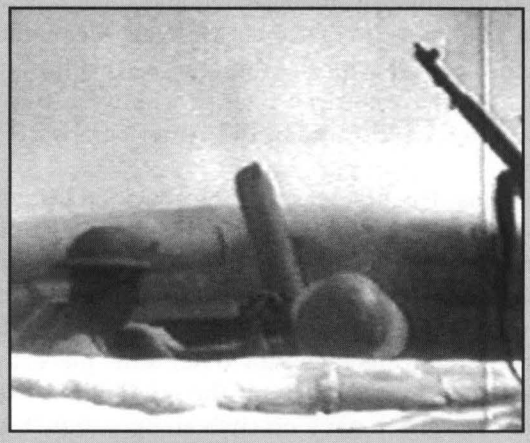
This plan was contingent on two false assumptions. The first was that the attack on Midway would come as a surprise to the Americans. Once again, codebreakers had been able to establish the exact battle plan, and the Americans were not caught in the Japanese trap. In fact, due to the wide distribution of Japanese naval forces, the whole operation order was sent by radio, and, due to a delay in changing codes, the Americans were able to intercept and interpret 90 percent of the message. By the time the attack did materialize, the Americans knew the date, time, place, and even the composition of Japanese forces. Despite some skepticism about the credibility of this information (would the Japanese really risk almost their entire navy on such an operation?), the American high command eventually became convinced that this was, indeed, the Japanese plan.

The second false assumption Yamamoto made, though again it was a reasonable one given the current expectations of the times, was that the decisive factors in the battle would be the heavy battleships. In fact, while Yamamoto hoped to engage the American fleet, and in particular her battleships, in a massive confrontation, most of the American battleships were actually in the harbor at San Francisco. The reason the Americans were not employing their battleships according to established naval principles was not because they were visionaries, but because the battleships were too slow and oilers and destroyers were not plentiful enough. However, history was about to be made, as, contrary to conventional expectations, the decisive weapon was not the battleships, which never got into position to be a factor, but the carriers and their deadly flying bombers (and the torpedo planes in the case of the Japanese).

As the Japanese fleet ran toward Midway, Nimitz sent the American fleet northeast of Midway, out of range of the Japanese search planes. He would use the planes at Midway for his own search missions. At the beginning of the battle, Yamamoto had 162 warships, including nine battleships, four large carriers and three light carriers, and host of support vessels, and more than 5,000 troops ready to invade Midway (which the Japanese had already renamed, "The Glorious Month of June.") Against this armada, Nimitz could only piece together a fleet of 76 ships, and a third of them were in the North Pacific Force and never got into the battle anyway. However, in addition to the *Yorktown*, the *Enterprise*, and the *Hornet*, the U.S. had an "unsinkable aircraft carrier"—Midway itself.

Before the battle, Midway was known only for its Gooney birds.

Preparing Midway



Midway was so crowded with Marines, planes, supply and oil dumps, and other installations that there was scarcely room for the "gooney birds," who croaked their displeasure in concert with the humming of plane motors and the booming of the surf. The base staff had their hands full with defensive preparations. One was to mine the likely approaches and landing beaches. People were busy monitoring radio traffic, most of which had to be coded or decoded; carrying out air search operations; unloading ships; and performing general duties on an immense scale. It kept everyone busy. Shortly before the battle, during a test of a demolition system, one sailor performed his part a bit too realistically. He threw the wrong switch and 400,000 gallons of aviation gasoline went up in flames. The fire was controlled and more than half a million gallons were left; but thereafter all planes, including B-17s, had to be refueled by hand from 55-gallon drums.

Fixing the *Yorktown*

The *Yorktown* reached Pearl Harbor on May 22 and was placed into dry dock for repairs. The reasonable estimate for repairs was 90 days, but, even before the dock had been entirely drained, Admiral Nimitz and his technical crew were sloshing around inspecting the damage. Nimitz told them that the ship had to be back in service in three days! Working around the clock, welders and shipfitters made their repairs and released the *Yorktown* back into the water on the morning of May 29. The next day, she headed for Midway to join the *Hornet* and the *Enterprise*. However, Admiral Halsey, the most experienced carrier commander, was hospitalized with a skin infection, and Rear Admiral Raymond A. Spruance was his choice as his replacement. Admiral Fletcher became the overall commander of the carriers.

On June 3, an American flying boat pilot spotted part of the attacking Japanese force. It was the Midway Occupation Force, but the main strength of the fleet remained undetected, hidden by bad weather. Attacks by B-17s from Midway failed to hit anything while a radar-guided night mission by amphibious Catalinas scored one torpedo hit on the oiler *Akebono Maru*,

A B-17 on Midway.

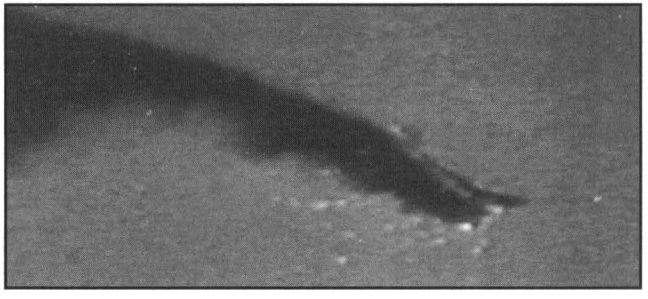
but didn't stop her for long. Meanwhile preparations were made at Midway for the anticipated attack.

The Fortunes of War

Little details can have fortunate or disastrous consequences, depending on how you look at it. As the Japanese made for their rendezvous with Midway, they detected a lot of radio traffic from Hawaii. Suspecting that the Americans were up to something, they sent out some flying boats with long range. By prior arrangement (since there was strict radio silence in the Japanese fleet), the flying boats were to meet with submarines at French Frigate Shoals, some nondescript islets about 500 miles west of Hawaii. However the expected rendezvous had to be abandoned as there was an American seaplane tender there. In fact, the seaplane was there by design, since the Americans knew of the Japanese plan, thanks to Magic. Thus, an aerial reconnaissance was abandoned, and the Japanese were unable to ascertain that the American fleet was, in fact, no longer berthed at Pearl Harbor.

At dawn the next day the first Japanese planes took off toward Midway. Admiral Nagumo sent half his planes to attack Midway, holding back the rest in case any American ships were spotted. So far, none had been found. Scout planes were out looking, and in another twist of fate, one particular plane was late starting from the cruiser *Tone*. This late start was to figure prominently into the chain of the day's events.

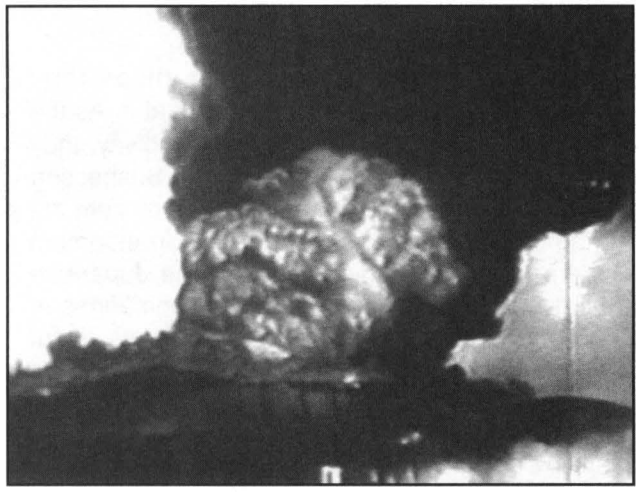
Even as the attacking planes sped toward Midway, scout planes had discovered Nagumo's carriers, and another plane spotted the attacking formations heading for Midway. The island was prepared and ready to meet the attack.

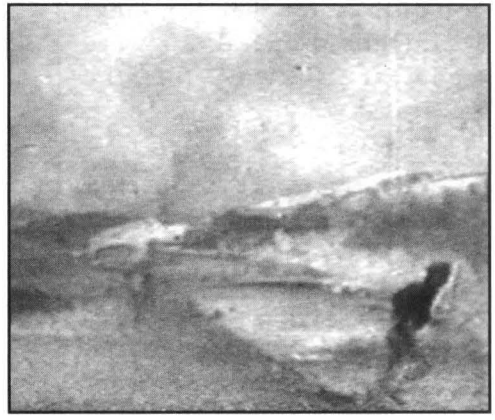


Anti-aircraft fire from Midway shot down or damaged 60 percent of the planes that attacked.

The Japanese roared in over Midway and dropped their bombs, but they were met with intense fire from the antiaircraft guns. Although the Japanese were able to destroy some buildings, they left the runways alone and actually did no critical damage. On the other hand, they lost more than 60 percent of their planes—38 shot down and about 30 more damaged too severely to fly again. This loss tipped the balance against the Japanese. It was clear that another strike against Midway would be needed, however.

While the first Midway attack was starting, Admiral Fletcher received word of the location of two of the Japanese carriers. He ordered Spruance to take the *Enterprise* and the *Hornet*





The damage on Midway was not critical, but it made a lot of smoke.

southwesterly and to attack the Japanese flattops as soon as he was able to confirm their locations. As soon as the *Yorktown* had recovered its scouts, Fletcher would follow.

As Nagumo received word about the situation at Midway, his own carriers were receiving the first of several attacks. Six torpedo planes and four torpedo-carrying B-26 bombers roared in to attack, but the only result was that seven of the planes were shot down.

Once the American attack had been beaten, Nagumo made the decision to rearm the torpedo planes with bombs and to reload the bombers with armor piercing bombs. This would take about an hour to accomplish, but, up to this point, no reports of enemy ships had reached Nagumo, so it seemed relatively safe to proceed. This happened at 7:15 A.M. Thirteen minutes later, a report came in. The American carriers had been sighted. The report came from the scout plane that had been late taking off. Nagumo ordered the scout plane to identify the ship types in the American force.

Meanwhile, another American striking group attacked, this time with 16 Dauntless dive bombers. However, with inexperienced crew, the bombers attempted a shallow glide attack instead of the more difficult, but more effective, steep dive. The attack was turned away, half the bombers destroyed. Equally ineffective was a high-altitude bombing run by B-17 bombers a few moments later, though the B-17s were undamaged as they headed back to base. Then an attack by old Vindicator bombers was broken up by the Japanese fighter cover with one loss and no hits against the Japanese ships.

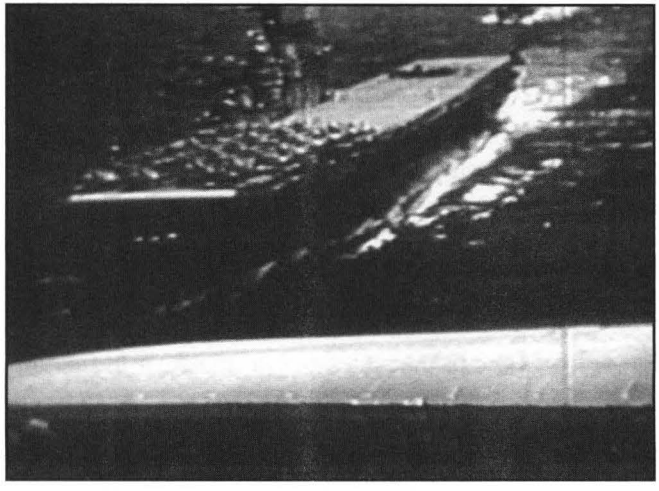
The scout plane in contact with the American fleet reported five cruisers and five destroyers, but ten minutes later came a message that caused Nagumo some concern. The scout reported that what appeared to be an aircraft carrier was following the American force. Now Nagumo had a decision to make. He decided to wait. He felt that he should recover the first Midway attack force, rearm them, and send a strong attack out with fighter cover. If he launched his planes now, they would be without fighter cover and, based on what he had just observed in the American failure to score even one hit in four attacks, he felt justified in waiting. First, the Americans had not seemed to be so dangerous. Second, without fighter cover, the same fate might await his bombers.

Spruance, aboard the carrier *Hornet*, was trying to close within 100 miles of the Japanese carriers before launching his planes to attack, but he was concerned with hitting the Japanese as soon as possible. Consequently, he attacked two hours before his optimal position was reached—at a range of 175 miles. This was at the extreme range of many of his planes, and risked losing them to empty fuel tanks, but Spruance reasoned, correctly as it turned out, that an immediate attack might surprise the Japanese carriers in the process of rearming their Midway attack planes, a time when they would be most vulnerable.

Behind Every Great Man

Spruance had taken over from Halsey, as chief of staff, Captain Miles Browning, one of the most irascible and unstable officers ever to earn a fourth stripe, but a man with a slide-rule brain. Browning figured out that Nagumo would order a second strike on Midway, that he would continue steaming toward the island, and that the golden opportunity to hit his carriers would arrive when they were refueling planes for this second strike. Spruance accepted these estimates and made the tough decision to launch at 0700, when about 175 miles from the enemy's calculated position, instead of continuing for another two hours in order to diminish the distance. Spruance also decided to make this an all-out attack—a full deckload of 20 Wildcat fighters, 67 Dauntless dive-bombers and 29 Devastator torpedo-bombers—and it took an hour to get all these airborne. Fletcher properly decided to delay launching from the *Yorktown*, in case more targets were discovered; but by 0906 his six fighters, 17 SBDs and 12 TBDs were also in the air.

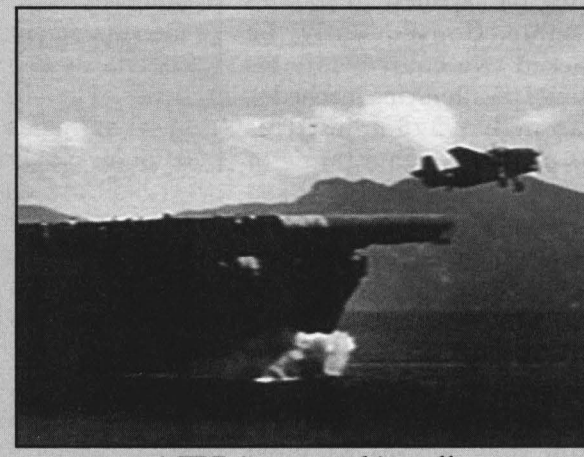
Spruance launched his entire strike force—68 dive bombers, 30 torpedo planes, and 20 fighters. He kept only a handful of fighters for air cover. Fletcher, meanwhile, waited another 90 minutes before launching his planes, in case other Japanese carriers should be discovered. He had learned his lessons in the Coral Sea, and didn't want to waste an attack opportunity on one target and leave other important targets untouched. When he did launch his planes, he kept about half the dive bombers back as reserves.



However, since he had decided to wait, Nagumo had changed course to open up the distance between him and the Americans. Therefore, when the fighters and dive bombers from the *Hornet* arrived at the expected position of the Japanese fleet, they found only empty ocean. Unable to locate the enemy, they were forced eventually to return. However, Torpedo Squadron 8 led by Commander C. Waldron attacked and were completely destroyed by the defensive fighter screen and antiaircraft fire. Another torpedo group, this one from the *Enterprise*, was

also decimated, losing ten of fourteen planes without achieving any results. However, the sacrifice of these TBFs was not meaningless. Even as the Japanese fighter CAP was dealing with this low-altitude threat, the dive bombers were coming into position.

Ensign Gay and Torpedo 8



A TBF Avenger taking off.

"When Tex Gay flew with his squadron to attack the Japanese fleet, he couldn't have known what would happen--that he would be the lone survivor and that he would have a ringside seat to watch the rest of the battle. But after his skipper [Waldron] was shot down and his radioman killed, it was clear that 'the worst had come to the worst.' But Gay's misfortunes continued as he was hit in the left arm by a machine gun bullet.

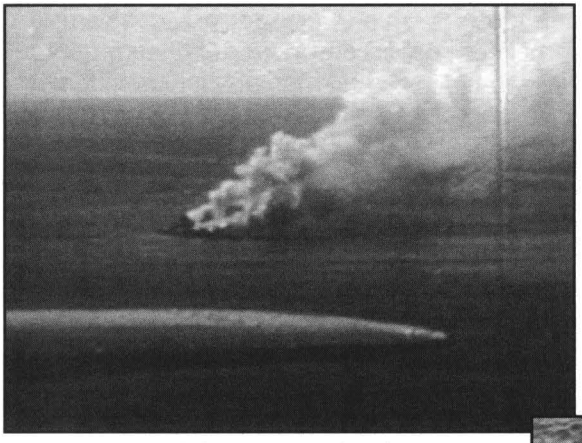
"He shifted the stick to his left hand, ripped his sleeve, pressed a machine-gun slug from the wound with his thumb. It seemed like something worth saving, so he sought to put it in the pocket of his jacket. When he found his pocket openings held shut by his safety belt and parachute straps and life jacket, he popped it into his mouth.

"He kicked his rudder to make his plane slip and skid so as to avoid the Zeros. He was heading straight for the carrier that the Skipper had picked out. The ship turned hard to starboard, seeking to put its bow forward and avoid his torpedo. He swung to the right and aimed for the port bow, about a quarter length back. When he pushed the button to release his torpedo nothing happened. Apparently the electrical releasing equipment had been knocked out. Since his left arm was practically useless from the bullet and a shrapnel wound in his hand, he held the stick between his knees and released the torpedo with the emergency lever. By now he was only 800 yd. from the ship and close to the water. He managed to execute a flipper, turning past the bridge of the carrier and clearing the bow by about 10 ft." (from **The United States Navy in World War II**)

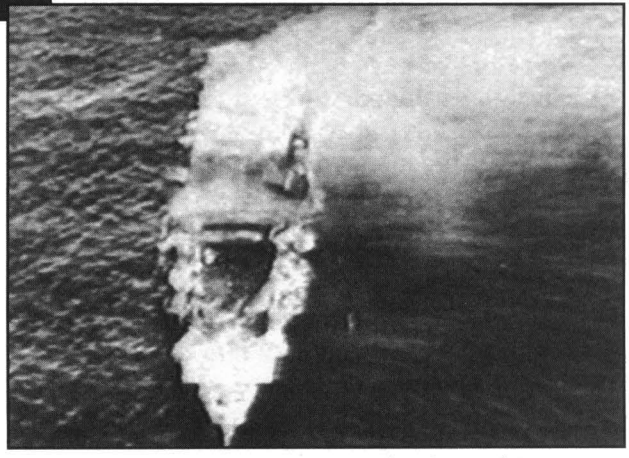
Gay's luck held out to some extent. Though his plane was immediately jumped by Zeros and shot down, he was able to find a flotation cushion and a rubber boat floating nearby when he bobbed to the surface of the Pacific about a quarter mile from the carrier that had been his target. Hiding under the cushion, he was nearly run over by two cruisers and a destroyer, and, though he was spotted by the destroyer's crew, nobody bothered with him. Thus, Ensign Gay was in a perfect spot to witness the devastating attack of the dive bombers as the arrived and sank the Japanese carriers. He was later rescued.

Arriving shortly after the *Enterprise*'s planes, the attacking force from the *Yorktown*, which had stayed fairly well organized, also attacked. They were actually lucky to find the Japanese carriers as they had missed them at first. But persevering in the search, Lieutenant Commander Maxwell F. Leslie, after having his and three other bombs accidentally jettisoned by faulty wiring on the bomb activators, was able to spot a destroyer from the carrier force. The destroyer was heading at high speed on a northeasterly course, having just chased an American submarine that had endangered the carrier fleet. Spotting this lone destroyer, Leslie made the correct assumption—that it was on its way to rejoin the carriers—and turned on the same heading. Thus he arrived from a different direction at about the same time as the planes from the *Enterprise*. It was a perfectly coordinated, if exceptionally lucky, attack.

The crew of a Dauntless Dive Bomber.



A smoking Japanese ship.



A Japanese carrier just after being hit.

First to attack were the torpedo planes, flying low with fighter cover. Only two of these planes survived, despite the effective tactics of the fighters led by Commander James Thach (see sidebar). However, even as the Japanese defenders were busy fighting the torpedo planes and Thach's fighters, the dive bombers from the *Yorktown* and the *Enterprise* came from high above, screaming down on the undefended carriers. The Japanese carriers were littered with bombs, fuel tanks, and fully armed aircraft. They were still turning into the wind, ready to launch. The first victim, the *Akagi*, received two direct hits and one near miss. Bombs, torpedoes, and half-empty fuel tanks were detonated, and the carrier quickly became an inferno.

Preparing the *Yorktown* for Attack

As soon as the radar showed the attacking Japanese planes approaching, preparations aboard the *Yorktown* began. "Refueling stopped instantly. On the *Yorktown's* stern there was an auxiliary fuel tank holding 800 gallons of aviation gasoline. [Captain] Buckmaster ordered it dumped over the side. Fuel lines were drained and then refilled with carbon dioxide gas under twenty pounds of pressure. Watertight doors were slammed shut and dogged down, and the fighters which had been circling over the *Yorktown* were vectored out to meed the incoming Japanese.

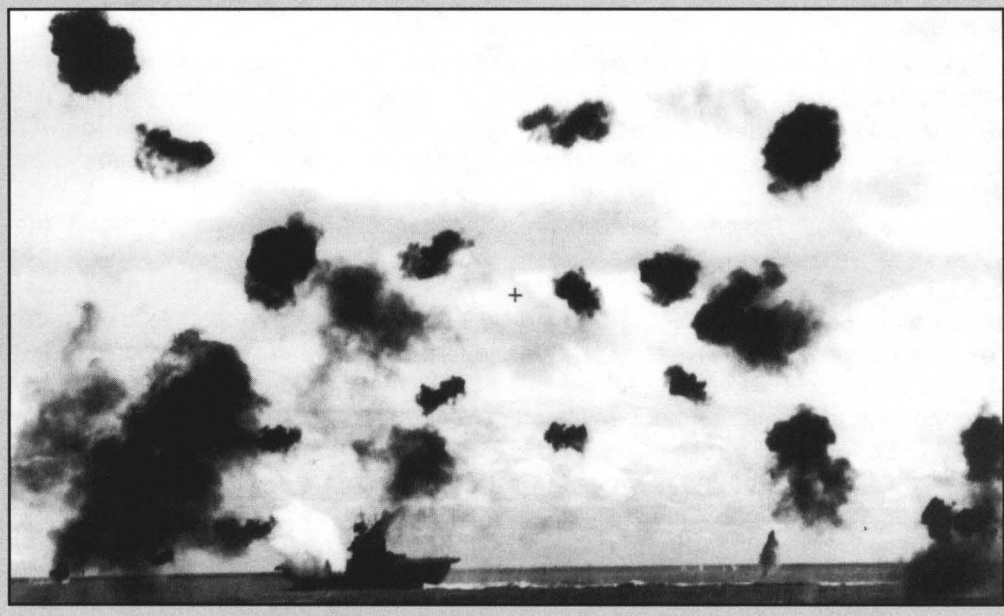
"Lieutenant Commander Leslie, who had already led his dive bombers triumphantly into the carrier's landing circle, was ordered to form a combat air patrol and to stay clear of the *Yorktown's* anti-aircraft fire. Doctors and pharmacists' mates rushed to the wardroom, where they waited for wounded shipmates to be carried in; gunners cocked their weapons; and damage control parties, stationed throughout the ship, were poised for the first explosion. On the flag bridge Admiral Fletcher, helmet pushed down over his head, pored over a large chart and plotted his next move, while the officers and men about him buttoned up their shirts to the neck, rolled down their sleeves, and tucked trouser legs into their socks as a precaution against flash burns." (from **The United States Navy in World War II**.)

The *Yorktown's* Last Battle

"Coming in through the massed anti-aircraft fire of the destroyers and cruisers, along with the hastily improvised CAP, only seven of Kobayashi's bombers got through. As the first bomber approached, he dropped his bomb and missed. As the pilot levelled off next to the carrier's deck 'thumbing his nose at the *Yorktown's* bridge,' he was shot down by a bullet that ripped up his tail. The next bomber, however, was already in his dive and dropped a bomb along the starboard side of the ship near the Number Two elevator. This bomb started several fires and killed many men manning guns in that section. However, the next bomb hit perfectly and ripped through the flight deck, exploding deep inside the ship and causing more fires. Then a third bomb tore through the starboard side and exploded inside the ship. Now the damage control parties tried to stifle the fires and save the ship as five bombers and three fighters from Kobayashi's flight headed back to the *Hiryu*. Kobayashi himself failed to make the return flight; he had been shot down."

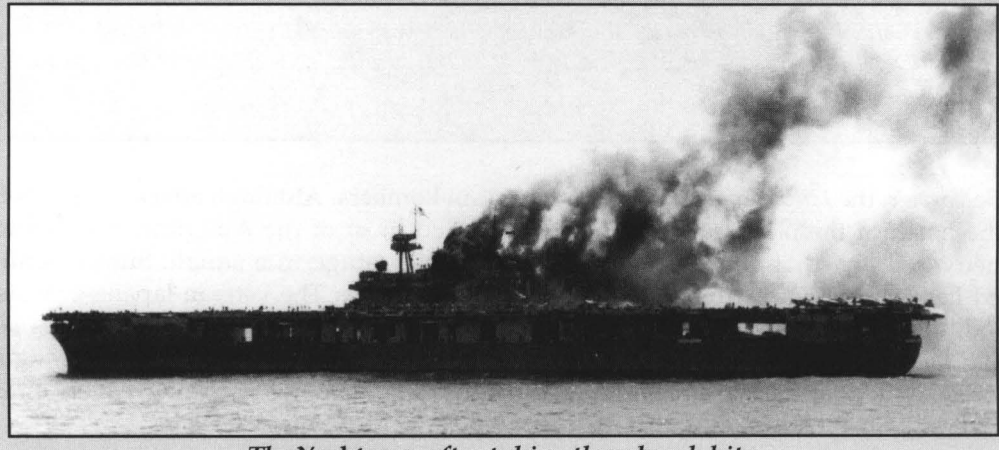
With three bomb hits, the Yorktown was in trouble, but was not yet sinking. Although Fletcher was forced to abandon the carrier as a flagship, it was put in tow. Luck was not with the *Yorktown* that day, however, and another force of Japanese planes arrived, sent out based on information from a survivor of the first attack. This second force consisted of ten torpedo planes and six fighters—all that Yamaguchi had left aboard the *Hiryu*.

On the *Yorktown*, damage had been controlled and some power restored to the engines when this newest threat appeared. Led by Lieutenant Tomonaga in a plane with only one functional gas tank, the torpedo planes roared in toward the crippled carrier while a makeshift fighter defense attempted to intercept them. Although five planes were destroyed, four of the remaining five were able to launch their fish. The *Yorktown* was able to twist and



Anti-aircraft fire fills the air as the Japanese attack.

turn to avoid half the torpedoes, but two of them scored on the port side. "There were muffled explosions, like rolling thunder, and it seemed to those on deck that the *Yorktown* had been lifted a foot or two out of the water. Paint flew off the bulkheads, books toppled from their racks, and electrical power failed, plunging the lower decks into darkness. The whine of the generators petered out; the rudder, turned to the left at the time of the explosions, was jammed tight, and the steam pressure which had given the *Yorktown* a momentary reprieve vanished." (from **The United States Navy in World War II**.)



The **Yorktown** *after taking three bomb hits.*

The *Kaga*

The 26,900-ton *Kaga*, even from Leslie's great height, looked huge to him when contrasted with the 10,000-ton *Soryu*. "Our target was one of the biggest damned things that I had ever seen," one of Leslie's officers said later. Using only a slight change of course to the left or right, Leslie could have attacked either carrier, but the *Kaga*, because of her great size, was marked for destruction.

Lieutenant Commander Leslie's plane was without a bomb, having lost it due to a faulty release. However, he led his dive bombers into position, selected the target, the 26,900 ton *Kaga*, and sent his plane over into a 70° dive at 280 knots. Behind him, the other pilots followed, one by one, their 1,000 pound bombs ready to drop. "He saw dozens of planes spotted for takeoff, and forward there was a large red sun painted on the carrier's flight deck on which he took careful aim. At 10,000 feet he opened fire with his machine guns, peppering the deck and bridge with 50-caliber bullets. At 4,000 feet his guns jammed; he pulled out and began to climb. Behind him came Holmberg, who could now see the first flashes of gunfire from the fringe of the *Kaga's* flight deck. His dive was perfect as the red disk on the flight deck loomed in his sights. Shrapnel tore at his plane. At an altitude of 2,500 feet, he pushed the electric bomb-release button and immediately jerked at the manual release lever to make sure that his bomb got away.

"There was a tremendous burst of fire near the superstructure. Pieces of the *Kaga's* flight deck whirled in the air; a Zero taking off into the wind was blown into the sea; the bridge was a shambles of twisted metal, shattered glass and bodies. Captain Okada, his uniform torn and burned, lay dead amidst the smoking wreckage of his command post. Then came three more vicious explosions, hurling planes over the side, tearing huge holes in the flight deck and starting fires which spread to the hangar deck below...." (From **The United States Navy in World War II**)

The Kaga *was hit four times, destroying the superstructure, the flight deck, the fire-fighting equipment, and detonating munitions on the deck. The destruction was everywhere, but even worse was the destruction of the* Soryu *which was hit with three bombs. The* Soryu *was so badly hit that it was abandoned twenty minutes after the attack. The* Kaga *and the* Akagi *sank later that evening.*

Only one carrier, the *Hiryu*, had evaded the American bombers. Although attacked, she had been far to the north of the other carriers and had avoided most of the American planes and had outmaneuvered any that showed up, possibly seeking refuge in a squall. Subsequently she launched her own planes in a retaliation raid on the *Yorktown*. The veteran Japanese pilots' aim was good. Led by Lieutenant Michio Kobayashi, eighteen dive bombers and six Zeros left the *Hiryu* and flew northward at 13,000 feet. It was just sixteen minutes after the devastating attack on the *Kaga*, and Kobayashi was able to take his heading from the returning American pilots, who unwittingly helped lead him directly toward the American carrier.

Aftermath of the American Bombs

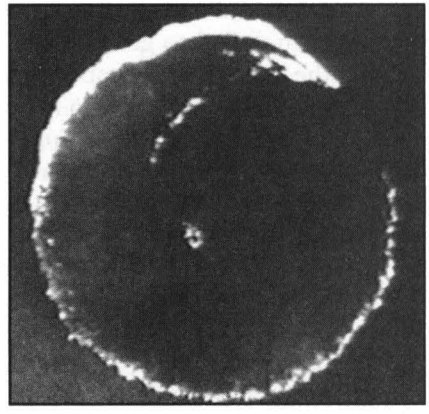
"A destroyer came alongside the *Akagi* and took the Admiral [Nagumo] and his staff to the cruiser *Nagara*, from whose mast Nagumo broke his flag. From her bridge he watched his splendid command disintegrate.

"The *Soryu* had been bombed too. Her engines stopped, water poured into the bilges, the pumps failed to work, and hundreds of scorched sailors, fleeing before the flames, threw themselves into the sea. The *Soryu's* commanding officer, Captain Ryusaku Yanigimoto, stood resolutely on his blackened bridge. A destroyer pulled alongside and an attempt was made to persuade him to leave the doomed ship. He refused to be rescued and was last heard calmly singing the Japanese national anthem, while clouds of smoke closed about him.

"All three carriers were fiery derelicts now, and fire fighting parties left on board fought a losing battle against the flames. Many sailors from the *Kaga* were swimming in the oily water when a torpedo from an American submarine streaked toward their burning ship. Instead of exploding it struck the *Kaga's* side at an angle and then came apart, the warhead sinking and the buoyant after section floating free. Immediately several Japanese sailors swam over to the floating part and hung on." (from **The United States Navy in World War II**.)

The *Yorktown*, affectionately known as "Waltzing Matilda," had to be abandoned. A torpedo had hit about 15 feet below the waterline, warping the quick-acting doors and flooding large sections. The carrier was listing badly and might "turn turtle" at any time.

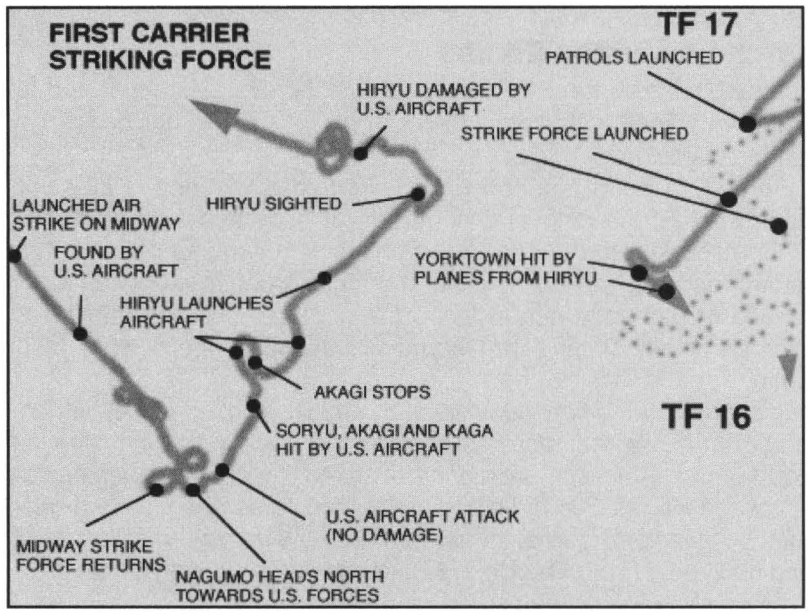
But the destruction of the Battle of Midway wasn't yet complete. As the *Hiryu* tried to get out of range, twenty-four dive bombers caught her and their bombs left her crippled. The *Hiryu* was abandoned during the night and sank the next morning, though neither side knew of her sinking at the time.



A crippled ship sails in helpless cirlces.

Despite the incredible success the American bombers had enjoyed during the day, it was clear that the Japanese still had an overwhelming sea-going force with their superiority in battleships and general gun power. In a night engagement, the American forces would be at a considerable disadvantage, so Spruance, now in charge of the operation with the loss of the *Yorktown*, decided to head first east, then west to throw off the Japanese.

Yamamoto had not given up, and he raced in with his battleships while the rest of the Japanese fleet closed on Midway, intending to shell it into submission. However, by the next morning a demoralized Yamamoto realized that the loss of of all his available carriers and his inability to engage the American fleet in a night battle signaled an unprecedented Japanese loss of the highest magnitude and ordered a general retreat. The Battle of Midway was over. Only one additional encounter occurred. As the Japanese turned and headed away, they encountered



the American submarine *Tambor* and turned abruptly to avoid it. However, one of the cruisers, the Mogami, failed to get the turn order and ran into the Mikuma. Both were damaged and fell behind the fleet where bombers found them the next day and sank the *Mikuma* and damaged the *Mogami* badly enough to keep her out of action for a year.

Finally, running low of fuel and risking retaliation from Japanese planes based on Wake Island, Spruance returned to port.

The Battle of Midway was a decisive victory for the Americans. The four lost carriers were a devastating loss to the Japanese. Also significant were the losses of 350 planes and many of the most experienced pilots. Many had participated in the raid on Pearl Harbor and had flown in China before that. Because the Japanese never did have a really effective training program for new pilots, these losses were all the more damaging to the Japanese.

Despite the overwhelming American victory, there was some reason for concern on the winning side. Operations had been anything but smooth. Returning planes had not been notified of changes of position and ran out of fuel before finding their carriers. During the heat of the battles and afterward, important information was not relayed effectively, and even the actual results were not correctly attributed. It was believed at the time that the land-based forces had contributed to the victory, but, in fact the land forces had scored only minor hits other than a spectacular and heroic crash dive by a Marine bomber.

"It was known, of course, that four of the largest Japanese carriers had been sunk—but it was hard to believe that a handful of dive-bombers from the *Yorktown* and *Enterprise* had done all the damage. The Army Air Force's heavy bombers based on Midway had flown a total of fifty-five sorties against the Japanese fleet and dropped 184,000 pounds of bombs. Navy and Marine Corps bombers and torpedo planes from Midway dropped over 50,000 pounds more, as well as seventeen torpedoes. Surely, it seemed, they must have hit something." (from **The Two-Ocean War**)

The Thach Weave: From Matchsticks to Combat

When Lieutenant Commander (later Admiral) John Smith Thach first heard about the new Japanese fighter, the Mitsubishi A6M2 Type O, the infamous Zero, it was shortly after that plane had first been encountered in China. It was spring, 1941—months before Pearl Harbor. "The report described a new Japanese aircraft, a fighter, that performed far better than anything we had. It was reported to have a climb of more than five thousand feet per minute. It had very high speed and it could turn inside of any other aircraft. Well, those are the three advantages that a fighter pilot needs to have if he is going to be successful in combat. At least, he would like to have two out of three—high speed and a high rate of climb with the ability to turn rapidly. Now you can turn altitude into speed just by putting your nose down, but you can't change the rate of climb or how tight an airplane will turn. This is built into it.

"When I realized that this Japanese airplane—if the intelligence report was correct—had us beat in all three categories, it was pretty discouraging. Some of our pilots just didn't believe it and said, 'This can't be. It's a gross exaggeration.'

"At the time, Thach simply told his men, 'All right, let's assume that it is exaggerated. Let's say the plane is only half as good as this report says it is. Let's put down these figures. Let's say it has only twenty-five-hundred feet per minute of climb. We have eleven hundred. Suppose it doesn't have such a high rate of turn. Cut that in half and it still looks like it can turn inside of us. Do the same thing with speed. If you allow only half the speed reported, this plane would still do about the same as we do.'"

However, the intelligence report turned out to be essentially correct. "As it turned out, this Japanese plane did have a climb of about three thousand feet per minute. It could turn inside of anything and it did have a lot more speed than we did, even carrying more gasoline."

Thach drew upon experience in football and basketball where, even against superior players, strategies could be worked out to nullify their superiority. The question was, what strategy would work in the deadly world of fighter combat?

Staying up nights, Thach wrestled with the problem. "I used a box of kitchen matches and put them on the dining room table and let each one of them represent an airplane. In this way I could get as many airplanes in the air as I wanted in various formations and then try to decide what they ought to do." Thach was looking to improve over the obsolete Vic formation that had become so standardized during and after World War I. "In order to fight in three-plane sections in that formation, I decided that each plane had to have three eyeballs: one to look at the leader, one to look through the gunsights, and one to keep an eye on the other wingman so you didn't run into him."

Thach was looking for a sudden maneuver that could nullify the Zero's advantages. His solution, eventually known as the Thach Weave, was to divide the planes into four-plane sections. "I asked myself what would happen if you just had two-plane sections as part of a four-plane division or combat unit. In that case, you are in the air as a part of the combat unit and you see an enemy aircraft. You know that either you want to get him or you want to avoid getting shot down yourself. Now you don't run away from him unless you're sure you've got a headstart. Assuming that he has greater speed, you have to turn towards him.

You turn towards him and hope that he won't get a good shot and that you will. Enemy aircraft in the area are coming in to attack you. They are off to the side and so you turn toward them. Well, they have got to pick some target. If we split a little wider apart at that point into a sort of wide formation, the enemy will have to take on one of the two-plane sections. If he goes after the one on the right, the one on the left, presumably, might have a chance to shoot him in a cross fire. 'Let's try that,' I thought."

Thach finally decided that the planes should fly at a distance equal to their tactical diameter—the diameter of the tightest circle or half circle they could make. If the enemy attacked head on, the first plane would shoot back while the rear plane of the opposite section could turn in for a crossing shot.

"Now if the enemy came from astern, we had a lookout doctrine that applied. The two-plane section on the right of the combat unit watched over the tails of the two-plane section on the left and vice versa. If you were on the right side you never needed to look to the right. You always kept an eye open over to the left. This was so that somebody would know if an enemy plane was coming up on the combat unit's tail.

"Often I talked to myself while working on a problem of this kind. It seemed to help. So I said, 'If we are really going to fool him we won't use any signals. We'll have to wait until he's almost within lethal firing range, and then the one who's watching him will make a sharp turn towards the plane being attacked. This is the signal that somebody is right within firing range on its tail. The pilot of the plane being attacked won't be able to see him because he can't see straight astern. So if you are in the left section and you see an enemy attacking the section on the right from astern, you turn hard right. What does this do? The attacking aircraft has to take a lead. If it's diving in, it has to take a lead, an extension of his target's flight line as he sees it. But his target suddenly turns after the enemy has committed himself. That throws off his lead and he's not going to hit. And if he tries to follow on around to get back his aim, he's got to do at least two maneuvers: he has got to put his wing down and then pull his nose back up again. That takes time. It should bring him right into the gunsights of the other section of aircraft, which should have a good shot at him, either head on, if he continues to follow his target, or from a good side approach if he pulls out. Although he has superior performance, we have a shot at him, but he hasn't got a shot at us, at least not an accurate one.'"

After testing this technique in the air, they found it uncanny how difficult it was to get a clean shot at a target fighter, even throttled down to half speed.

"So we felt a little better about the situation revealed in that intelligence report on the Zero. We had been proving all of our fighter lives that an airplane with superior performance could knock you out of the air. That was it. There was no question about it. If you met him he was going to get you, assuming he wasn't a stupid pilot. You can never assume the enemy is not going to be experienced and able to shoot. But now we had something to work on, to keep us from being demoralized. It also gave us something of a plan. I've always felt that in athletics, football or basketball or any competitive sport—and the same applies to combat—you've got to have a plan. Even though it proves to be a lousy plan, at least it is better than having no plan. If you start working at yours you might keep the enemy off balance." (from **The Pacific War Remembered.**)

Thach to the Test

"So we boarded our planes. All of us were highly excited and admittedly nervous. I think most other people did pretty much what I did. I kept going over my check-off list. As soon as we got in the air, I had each section test their guns so they'd be ready and see that all the switches were on and not on safety. This seemed to work all right, so in we went.

"Lem Massey made a small change and we took off on a heading of about southwest. I wondered why he did that. Had he gotten some more information? About that time, looking ahead, I could see ships through the breaks in the little puffy clouds, and I figured that was the reason. We had just begun to approach about ten miles from the outer screen of this large force (Vice Admiral Chuichi Nagumo's Carrier Striking Force, which consisted of four carriers, two battleships, three cruisers, and eleven destroyers). It looked like it was spread over the ocean. Several colored antiaircraft bursts were seen in our direction, one red and the other one orange—and then no more. I wondered why they would be shooting at us, because we weren't quite within range. We weren't even nearly within range. The bursts came from the nearest ship, which was quite a distance from the main body of carriers and battleships. We soon had our answer. We'd been sighted from the surface screen and it was alerting the combat air patrol. A very short time after, Zero fighters came down on us—even before we got anywhere near antiaircraft range. I tried to count them. We had been trained to count things at a glance. I figured there were twenty.

"Then one of our planes was burning. He pulled out and I didn't see him anymore. He was shot down right away. I didn't see the Zero that got him either. It didn't take me long, however, to realize that they were coming in a stream on us from astern. I was surprised they put so many Zeros on my six fighters. I had expected they would go for the torpedo planes first. They must have known we didn't have the quick acceleration to catch them, the way they were coming in at high speed in rapid succession and zipping away. But then I saw they had a second large group that was streaming right past us and into the poor torpedo planes.

"Macomber, leading the second duo of fighters, was too close to me to permit an effective weave, and I was not getting very good shots at the Zeros. I called him on the radio an said, 'Open out more. About double your present distance and weave.' No acknowledgement. His radio must have been bad. He has since stated it was.

How ironical [*sic*] this situation had become! I had spent almost a year developing what I was convinced was the only way to survive against the Zero and now we couldn't

seem to do it. I kept wondering why Macomber was so close instead of being out in a position to weave. Of course, he had never practiced the weave. He was one of the VP-42 pilots based aboard the Yorktown during the Coral Sea battle, and he had tangled with some Zeros then. Like the other former VP-42 pilots, he had reported to VF-3 just before we flew out to land aboard the *Yorktown* en route to Midway. I had assumed my exec, Don Lovelace, had briefed them or had them read the squadron tactical doctrine. Suddenly I realized that Don didn't have much time to brief anyone before falling victim to a grisly accident that claimed his life * (*Lieutenant Commander Donald A. Lovelace died in an accident on 2 June 1942 while on duty on the* Yorktown). I had tried so hard to wipe that horrible event from my mind that I forgot Don was no longer with us.

"Then I remembered telling my flight during the last-minute briefing to stick together. Macomber must have thought I meant for him to fly a closed-up formation. What I actually meant was I wanted no lone-wolf tactics. It was too late to correct that misunderstanding now. I couldn't see the two pilots who flew slightly below us with the torpedo planes, so I turned to my wingman, Ram Dibb, and said, 'Pretend you are a section leader and move out far enough to weave.' His voice sounded elated to get this 'promotion' right in the middle of a battle.

"Several Zeros came in on a head-on attack on the torpedo planes and burned Lem Massey's plane right away. It just exploded in flames. And beautifully timed, another group came in on the side against the torpedo planes. In the meantime, a number of Zeros were coming down in a string on our fighters. The air was just like a beehive, and I wasn't sure at that moment that anything would work. And then my weave began to work! I got a good shot at two Zeros and burned them. One of them had made a pass at my wingman, pulled out to the right and then come back. We were weaving continuously. I got a head-on shot at him and then Ram, the wingman, radioed, 'There's a Zero on my tail.' He didn't have to look back because the Zero wasn't directly astern. He was at about a forty-five-degree angle and beginning to follow Ram around, which gave me the head-on approach. I was really angry then. I was mad because my poor little wingman had ever been in combat before. In fact, he had very little gunnery training. It was his first time flying from a carrier and this Zero was about to chew him to pieces. I probably should have ducked under the Zero, but I lost my temper and decided to keep my fire going into him so he'd pull out. He did, and I just missed him by a few feet. I saw flames coming out of the bottom of his airplane. This was like playing chicken on the highway with two automobiles headed for each other, except we were shooting at each other as well. It was a little foolhardy, but I think when I hit him it pulled his stick back and his nose went up. The first reaction on being hit is to jerk back. I wanted him to pull out. I was going to force him to pull out. That is a foolish thing to do. I didn't try that anymore. You really don't need to, because if you haven't hit by the time you get there you can certainly afford to duck under, and then you'll get away.

"The Japs kept coming in. By this time we were over the screen and more of our torpedo planes were falling, but so were some Zeros. And we thought, At least we are keeping a lot of them engaged.

"We could see the carriers now. They were steaming at very high speed and launching airplanes. And those planes looked like more fighters. I couldn't tell. I just got a glimpse. They were beginning to maneuver.

"Now the torpedo planes had to split in order to make an effective attack. We used to call it the Anvil Attack. They would break up formation and spread out in a kind of line on each side of the target, the carrier. The reason a formation of torpedo planes has to split is so they can come in against a carrier from various points around at least 180 degrees of the compass. If the target ship turns right, he has left a broadside shot for several torpedoes. If he turns to the left, then the ones on the other side get the same advantage. The ship can comb only one of the oncoming torpedoes. By combing I mean just heading right for the torpedo and barely avoiding it so that its extended track is parallel to the ship but clear of its side."

"We fighters thought we were doing pretty well until our torpedo planes split. Then they were extremely vulnerable, just all alone with no protection. And the Zeros were coming in on us, the fighters, one after the other. Sometimes they came in simultaneously from above and to the side. We couldn't stay with the torpedo planes except for the one or two that happened to be under us.

"I kept counting the number of airplanes I knew I'd gotten in flames going down. I couldn't bother to wait for them to splash. But I could tell if they were flaming real good and there was something besides smoke. If you saw real red flames, why, you knew a plane had had it.

"I had a little kneepad and I would mark on it every time I knew one was gone. Then I realized this was sort of foolish. Why was I making marks on my kneepad when the kneepad wasn't coming back? I was utterly convinced then that we weren't any of us coming back because there were still so many Zeros. They had already got one of our six, and two more of them I couldn't see anymore. There seemed to be only Macomber, Ram Dibb, and myself. Pure logic cried out that the enemy's superior performance and the number of Zeros he was throwing into the fight meant that we could not possibly survive. So I said to myself, 'This counting is a foolish thing. It takes a second or two to look down to your kneepad and make the mark. It's a waste of time.' And then I said, still talking to myself, 'We're going to take a lot of them with us if they're going to get us all.'

"But we kept working on this weave and it seemed to work better and better. The reason I tell about stopping my act of counting is because ever since then I haven't had the slightest idea how many Zeros I shot down. I can't remember and I don't suppose it makes too much difference. It only shows that I was absolutely convinced that nobody could get out of there, that we weren't coming back and that neither were any of the torpedo planes.

"Then it seemed that the attacks began to slacken. I didn't know whether they were spreading out and working more on the unprotected torpedo planes. But the torpedo planes continued on in. I saw three or four of them get in and make an attack. I believe that at least one torpedo hit was made. Now all the records, including those of the Japanese, say that no torpedoes hit. I'm not sure that the people aboard a ship that is hit by dive-bombers really know whether they were hit by bombs or by torpedoes. I was aboard the *Saratoga* when she was torpedoed and the *Yorktown* when she was bombed and I couldn't tell the difference.

"And then I saw a glint in the sun that looked like a beautiful silver waterfall. It was the dive-bombers coming in. I could see them very well because they came from the same direction as the Zeros. I'd never seen such superb dive-bombing. It looked to me like almost

every bomb hit. Of course there were some near misses, but there weren't any wild ones. Explosions were occurring on the carriers. About that time the Zeros slacked off more. We stayed around. We escorted two torpedo planes out, one after the other, and tried to get them clear. Then we went back and picked up another one that we saw. We stayed right with him and over him, hoping that the Zeros wouldn't have him all to themselves.

"After the dive-bomber attack was over, I stayed there between the screen and the carriers. A single Zero appeared, flying slowly below and to one side of us. I looked up toward the sun and, sure enough, there were his teammates poised like hawks waiting for one of us to take the bait. We didn't.

"I could see three carriers. I never did see a fourth one. And one of them, probably either the *Soryu* or the *Kaga*, was burning with bright pink flames and sometimes blue flames. I remember gauging the height of those flames by the length of the ship. The distance was about the same. It was just solid flame going skyward and there was a lot of smoke on top of that. Before I left the scene I saw three carriers burning pretty furiously. Then I came and picked up one torpedo plane and flew on back toward the *Yorktown* while providing protection for it.

"In all I was over the Japanese fleet a full twenty minutes. I had enough gas because we took off later than the other people. The fighters were the last ones to take off.

"In reflecting on this battle after the event, I realize that this classic coordinated attack, with torpedo planes going in low and the dive-bombers coming in high and almost simultaneously, was effective. I think it is usually better if the dive-bombers do hit first, for then the torpedo planes can get in better among the confusion of the bombs bursting. Here was a sort of reverse of the Coral Sea battle. I also realized that the people who died hadn't given their lives in vain. They'd done a magnificent job of attracting all the enemy combat air patrol; all the protection that the Japanese carriers had was engaged and held down, so we did do something, and maybe far more than we thought at the time. We engaged the enemy planes that might have gotten into the dive-bombers and prevented them from getting many hits.

"On the way back to the *Yorktown*, while escorting the torpedo plane, I felt my shoes were a little squashy. I reached down and felt this slippery liquid all over my leg. I thought it was blood. It felt like blood. I didn't want to look at it, so I just didn't for a while. I wiggled my legs and they felt all right, except I remember a little place on my shin that didn't feel too good. I thought, I must have bumped it getting in the airplane. I picked up my glove and looked at it and it was oil. I was never so glad to see oil on my hands in all my life.

"When we landed on board, the mechanic saw a hole in the gas tank and removed the tank to fix it. He opened it and found an incendiary bullet that was half burned. It had penetrated pretty near the bottom of the tank and had immediately been smothered by the gasoline, so it didn't do any damage, didn't set the tank on fire. The engine oil was all gone, but the good old engine had still ticked over and I had been able to get aboard ship. I had known while landing that I was low on oil because both my feet were wet with it and the oil pressure had dropped to zero. Apparently another Japanese bullet had shot the oil line away. (from **The Pacific War Remembered**.)

Most people have criticized Yamamoto's plan for its lack of foresight—not taking into account the almost inevitable possibility of something unforeseen occurring. Also, his disposition of forces, splitting the main group from the carriers, has been criticized. With seven battleships and additional cruisers, he might have defended the carriers better. Finally, the Japanese, so used to success, had simply gone into it with too much confidence and had gotten whipped.

On the other hand, the American leadership showed remarkable presence of mind and made the right choices. Spruance, in particular, has been praised for making the right decisions at the right time. He seemed to know when to attack and when to retreat, almost as if he could read the minds of the Japanese leaders. With a bit of luck, and good leadership, the Americans scored a clear and decisive victory in the most critical battle of the war in the Pacific.

Making Decisions

"It may surprise people these days that I should be able to make such a decision [about whether to support the torpedo planes or the dive bombers]. The truth is that in World War II, as a lieutenant, I made more decisions than some very high-ranking officers made in the Vietnam War. In that war the secretary of defense was telling us how many planes to send, what formation to fly, and at what altitude.

In my time we operated under a doctrine called good common sense." (Lt. Cmdr. John Thach (from **The Pacific War Remembered**))

Whether the Japanese could have succeeded if they had pressed the attack, or whether they should have launched a second attack to achieve superiority in the Pacific is debatable. Some would say that was their best chance of success. However, after Midway, the Japanese gradually became more defensive-minded and the flow of the war began, for the most part, to favor the Allies. Unable to achieve their goals at Midway—to destroy the American fleet before war-time production could replace the losses from Pearl Harbor and to secure Midway as a base for their "ribbon defense" which would span the Pacific from island to island—the Japanese had no choice but to concentrate on targets further south.

MIDWAY MISSIONS

US MIDWAY #1

Join Lt. Richard Best on his crucial dive bombing attack on the carrier *Akagi*. The Japanese carrier has been caught without CAP overhead.

Difficulty: Moderate

Strategy:

You start the mission at 15,000 feet behind your flight leader, Lt. Richard Best. Follow him to the target. Once he begins his dive bombing attack use the scan mode to get a

bearing on the target below you and begin your dive bombing attack. Once you complete the attack, get ready for the Zekes flying around you at this lower altitude. Use your dogfighting skills to drive them away.

JAPAN MIDWAY #1

American dive bombers are attacking your fleet at many points. Climb swiftly in your Zeke and you have a slim chance to save some carriers.

Difficulty: Impossible?

Strategy

You start at 10,000 feet approaching three groups of dive bombers approaching you head on. The closer group starts its attack run on your carrier shortly after the mission starts. Increase your speed by increasing your RPMs to 100%. Try to shoot the planes in the closer group before they begin their attack. Increase your altitude and begin your attack on the second group which is just out of view to your right. Because the planes are at various altitudes above and below, you'll need to refine your skills of shooting down dive bombers while they're in their attack dive in order to be successful in this mission.

US MIDWAY #2

Dive bomb the last remaining untouched Japanese carrier, the Hiryu. It was missed during the earlier assault. Prevent the counterstrike that sank the *Yorktown*.

Difficulty: Moderate

Strategy

You start at 15,000 feet with one SBD as your leader. Seek out the Hiryu, which is the only untouched carrier below. The Hiryu is located directly in front of you. Follow your leader to the target, manning the rear gunner's seat as necessary to fend off the attacking Zekes. Once you hear the AA flak use the scan mode to locate the target below and begin your dive bombing attack. Once you complete the bomb attack, watch out for the swarming Zekes around you. Use your dogfighting skills and your rear gunner's seat to take out the attacking Zekes.

JAPAN MIDWAY #2

The American planes have fatally damaged three of your carriers. The fourth, the *Hiryu*, is the only hope of striking back. Save it from the US dive bombers.

Difficulty: Moderate

Strategy

You begin your flight at 15,000 feet with one wingman at your side. Two groups of three dive bombers each are approaching you. Maintain your speed and altitude and begin your attack on the flight leader of the first group. After the group passes, turn 180 degrees and pursue them. Increase your speed to 100% to keep up with the group. As long as you take out at least two of the planes from the first group, your wingman should take care of the last one. Now turn and intercept the second group as you did the first, maintaining your speed and altitude. Attacking from slightly below the group will minimize gun fire from the rear gunners of the dive bombers.

US MIDWAY #3

Intercept the first *Hiryu* launched counterattack of dive bombers targeted for the *Yorktown*.

Difficulty: Hard

Strategy

You begin your mission at 15,000 feet. A large V formation of Val dive bombers approaches. Your wingman will bank right and attack the group from that side. You should bank left and attack the formation on the left. Concentrate shooting down the lead bombers first since they are the closest to the carrier. Once you take out the lead bombers, turn and take out the remaining bombers that are behind you. Avoid following the bombers into their dive unless it's absolutely necessary. You need to maintain your altitude to take out the remaining dive bombers before they begin their attack run.

JAPAN MIDWAY #3

Your Val has left the *Hiryu* and is nearing the carrier *Yorktown*. Sink it, or cripple it so the torpedo bombers can finish her off.

Difficulty: Hard

Strategy

You start at 10,000 feet with two other Vals approaching the *Yorktown*. Wildcats are in the air above you ready to make mince meat out of your plane. Adjust your course so that you are following directly behind the two other Vals. They will lead you to the target carrier.

As the Wildcats attack, keep close tabs on them. If any of them drop behind you, jump into the rear gunners seat and fight them off. Once the AA flak starts, you are pretty near the target. Jump between the pilots seat and gunners seat as necessary to monitor the location of the target and fight off the attacking Wildcats. Once you complete your dive bombing run, maintain your altitude and fight off the remaining Wildcats while sticking close to any remaining Vals in your group.

US MIDWAY #4

Save the *Yorktown*! The second wave of Hiryu planes composed of torpedo bombers is closing in to finish off the *Yorktown*.

Difficulty: Hard

Strategy

You start at 500 feet with two groups of Kates with three planes each approaching the *Yorktown*. The two groups are located to the left and right of you. The group on the left is closest, but the group on the right is closer to the carrier so attack this group first. Make sure you watch your altitude. This mission requires that you fly at 500 feet or less to engage the Kates on their attack run, making it very easy to run your plane into the water if you're not careful. Once you destroy or drive off the first group, turn and engage the last remaining group of Kates.

JAPAN MIDWAY #4

Your Kate torpedo plane represents the last chance to bring the *Yorktown* down.

Difficulty: Hard

Strategy

You start at 500 feet with the smoking carrier directly in front of you. Maintain your altitude and speed as you approach the target. Once the Wildcats try to jump you from behind, jump into the rear gunner's seat and shoot them down if you can. Switch back to the pilot's seat and maintain your course heading. As you get closer to the carrier, you'll notice that you are approaching from the stern of the carrier. This requires precision when you are releasing your warhead. Make sure your gun sight is directly centered with the target before you release your torpedo. Once the torpedo is released, increase RPMs to 100% and gradually climb. Man your rear gunner's seat to take out any remaining Wildcats on your tail.

Chapter 12
The Guadalcanal Battleground: The Eastern Solomons

Success at Midway was a big boost to American morale, but they had to move quickly to stem the Japanese advances to the south. In particular, the threat to New Guinea and Australia still existed. The loss of four major carriers was a severe blow, but the Japanese still enjoyed considerable naval strength and still had four carriers remaining. It was clear that the Japanese would keep trying. Already the enemy had several key landing fields scattered through the islands of the New Hebrides and the Solomons. The current thinking among the Joint Chiefs of Staff was to strike back and expand into the Japanese-held islands. This marked the beginning of the American counter-offensive.

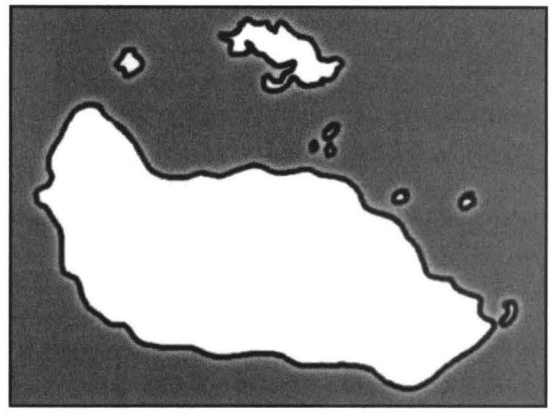
> **"A lion uses all its might in attacking a rabbit."**
> **—old Chinese proverb.**

However, another battle was being fought between General MacArthur and Admiral King over who should be in charge of these objectives. Since some of the areas were within MacArthur's command zones, he demanded operational control, but King was dead set against letting MacArthur control his vital naval forces, particularly the remaining carriers (of which the Americans had only four after Midway).

In many ways this was simply a battle fought for materiel. There was always enough money (according to some sources, anyway), but men and equipment were constantly in demand. Before the Allies began full-scale operations in Europe, the commanders of the Pacific theater

were trying to get their share of necessary forces and hardware. The arguments raged between the various factions, but eventually the navy's influence was adjusted one degree west to include the island of Tulagi where the Japanese had an air base. Under the overall command of Admiral Ghormley, capturing Tulagi and other nearby islands was considered Task One. Meanwhile, MacArthur was given responsibility for an operation along the northeast coast of New Guinea and further advances through the Solomons (Task Two). He was also given command of the final assault against the important air base at Rabaul, which had figured in the American plans for some time (Task Three). This was Operation Watchtower.

Completely outside the plan was the jungle island of Guadalcanal, but when scout planes observing Tulagi discovered the Japanese constructing an air base there, Guadalcanal was included in the Tulagi plan. Thus, one of the bloodiest and most hard-fought battlegrounds of the Pacific war was added almost as an afterthought.



Guadalcanal had been discovered in 1568 by the Spanish explorer Don Alverado Medana. It is at the bottom of a double strand of islands that extends for 560 miles, northwest to southeast. Through these islands runs the deep-water New Georgia Sound, known to American sailors as "the Slot." Until the war, Guadalcanal had been a deserted jungle island. Now it is known as a bloody battleground.

Part of the Guadalcanal invasion force.

Ships from Australia, Pearl Harbor, New Zealand, and San Diego all gathered on July 25 near Koro, a tiny island in the Fijis. The fleet included three carriers and a brand new battleship. Vice Admiral Frank Jack Fletcher was in charge while one of Admiral King's top strategists from Washington, Rear Admiral Kelly Turner, was in charge of the landing force. These 76 ships comprised the Guadalcanal invasion fleet.

As the plans were drawn up, Fletcher and Turner argued over the role of the carriers in the battle. Fletcher was unwilling to risk the carriers for more than two days within striking distance of the Japanese land-based planes. Having seen how efficiently the Japanese pilots could strike when given the chance, he was not willing to risk these precious ships any longer. However the landing force would need at least four days to complete their operations, and they would be left vulnerable should Fletcher pull out early.

Fletcher wouldn't change his position, however, and in the end he stated that he would leave in two days. After a dissatisfying rehearsal at Koro, the American fleet set out for Guadalcanal, Tulagi, and the neighboring islands of Gavutu and Tanambogo.

On Guadalcanal, the Japanese were completely surprised. Most of them were construction workers at any rate, and these fled into the jungle. The nearly completed airfield was quickly secured by the end of the second day, August 8. The Marines renamed the field Henderson Field after Major Lofton Henderson who had led the Marine dive bombers and who had died at Midway. The Japanese put up greater resistance on the other three islands, but the American forces were overwhelming and the invasion progressed according to plan. Then Fletcher, becoming increasingly concerned about possible enemy air strikes, decided to pull out—twelve hours earlier than planned. With a force of 78 fighters still operational, he had more than he had had at Midway, and Turner felt that he had abandoned his post.

As it turned out, Fletcher's leaving was to have some adverse consequences. A force consisting of several cruisers and a destroyer were headed toward the American fleet. It was commanded by Vice Admiral Mikawa Gunichi. Although they had been sighted by an Australian scout plane, the information wasn't conveyed to Turner until eight hours later. It was unclear whether these Japanese ships were headed for the American fleet or for one of the other islands, and a coded message that would have confirmed their destination wasn't decoded until much too late—weeks later, in fact.

The Japanese came in at night on August 8 and were able to blow up several of the Allied ships with their powerful torpedoes and guns. In all, their night raid cost the Allies four cruisers with damage to two destroyers and another cruiser. As one historian has observed, The Battle of Savo Island was the worst American naval defeat since 1812. It was certainly the worst day the U.S. Navy experienced during the war, with the possible exception of Pearl Harbor. The only satisfaction the Americans were to enjoy was the sinking of one of the heavy cruisers, the *Kako*, by an American submarine as it left the area. Had Fletcher kept his carriers in the area, he might have done considerable damage to this striking force as they retreated. His planes might have intercepted it en route, as well.

As it was, with the loss of most of his cruisers, Turner could only allow the unloading at Guadalcanal to proceed until noon the next day before he pulled out his remaining ships leaving the Marines a severe supply shortage. In fact, they only had about four days' supply of ammunition, no radar and little radio equipment, and their rations were so tight that they were limited to two meals a day for the first six weeks of the occupation. Needless to say, Turner was not popular with the Marines.

Still, they had the airstrip, and, using equipment salvaged from the Japanese, they worked quickly to make it operational. Within weeks, however, the Marines were forced to fight off Japanese troops who were ferried in each night on the infamous Tokyo Express. While the Tokyo Express delivered its load, the Japanese bombed Henderson Field incessantly. On August 15, four destroyer-transports delivered aviation fuel, bombs, and aircraft technicians, and five days later, the first planes flew in. There were 19 fighters and 12 dive bombers. As meager as conditions were on Guadalcanal, the establishment of a functional air base was critical.

THE BATTLE OF THE EASTERN SOLOMONS

While the marines attempted to secure Guadalcanal, the Japanese were planning to get it back. However, the Japanese had their own communication problems. The Japanese army had not been informed of the severity of the losses at Midway, and they hadn't expected any serious threat from the Allies earlier than mid-1943. Although they were caught rather flat-footed by the Allied counter-offensive, the apparent abandonment of the 2,000 marines on Guadalcanal seemed to underscore that there was no real threat so far. Based at Rabaul, Lieutenant General Hyakutaka Harukichi's Seventeenth Army was given the task of retaking Guadalcanal. Collecting a force of 6,000 men, the Japanese landed on Guadalcanal at Taivu, east of Henderson Field, on August 18 and launched an advance attack with a special force of 1,000 men of the Ichiki Force. This poorly executed attack was decimated by the American defenders.

The bloody battles on Guadalcanal took a terrible toll. After the battles, bodies littered the jungles and beaches.

However, this was just the prelude. On August 23, additional troops were landed under cover from the Japanese fleet that had moved in. The Americans had expected this move by the Japanese, however, and had brought Fletcher's carrier fleet back into the action. The Japanese, led by Vice Admiral Kondo Nobutake, steamed down from the north with three carriers, three battleships, nine cruisers, and additional destroyers and submarines. It was a formidable force. At the head of this fleet ran the *Ryujo*, some 60 miles south of the main group. The *Ryujo* was to act as bait, and, once the Americans pounced on her, the two carriers from the Coral Sea Battle, the *Shokaku* and the *Zuikaku*, would launch the full complement of their flight decks on the American carriers. Without the presence of the American carriers in this region, Guadalcanal could be cut off as the Japanese established superiority on the sea and strangled supply lines.

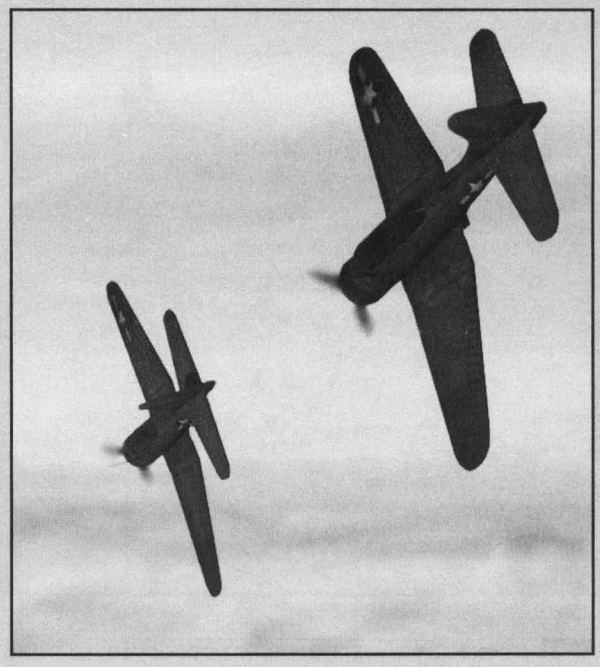
In charge of the *Enterprise*, *Saratoga*, and *Wasp*, Admiral Frank Jack Fletcher was now about to begin his third carrier battle. He began it with the odds against him. Intelligence from Pacific Fleet led him to believe the Japanese fleet was much farther north than it was. Consequently, he dispatched the carrier *Wasp* to refuel, leaving him with only two carriers to go against the three the Japanese had. Moreover, in a classic sea battle the Japanese, with three battleships, would hold the decisive advantage. Unfortunately for Fletcher, the Japanese were not only much closer than he thought, but they were ready to press the attack.

On the 23rd, scout planes searched the area north and northeast of the carriers, spotting several subs. Whenever these were spotted, the Dauntless scout pilots dropped bombs, but usually with no effect. However, at least two, possibly three may have received considerable damage from the bombings.

The next day the scouts were out again, searching in a wide fan pattern extending northwest to northeast. Several scouts located the *Ryujo*, and, despite recurrent radio problems, were able to transmit her location back to the American task force. Two of the scouts, a pair of TBFs, made a daring bombing run against the *Ryujo*, but narrowly missed the carrier. Meanwhile, the *Saratoga* launched an attack of 36 planes headed by Commander Harry Don Felt. As Felt headed for the Japanese bait, two SBDs dove on one of the large cruisers, but missed as she took evasive action.

Felt and his strike force didn't actually encounter the *Ryujo* until about 4:06 P.M. or 1606 in military time. By that time (in fact at 1530 hours) Lieutenant Ray Davis had discovered the main fleet, spotting the yellow carrier deck of the *Shokaku* as he flew at 1500 feet. As Davis climbed higher to get a better view, he was relaying the message repeatedly over his radio. He knew this was a critical discovery. However, the message didn't reach the flagship. It was picked up by some other ships which relayed it, but there was considerable delay before the message reached Fletcher. Meanwhile, Davis and his wingman, Ensign R. C. Shaw, decided to attack the *Shokaku*, wishing for all the world he had a full squadron or air group with him.

"It was a classic bounce as the two Dauntlesses plummeted on the *Shokaku* from upwind, down sun, while the first tentative tracers curled upwards from the ships below. The big carrier was beginning a starboard turn as the SBDs plunged through 5,000 feet and the black bursts of heavy AA fire thumped nearby, occasionally jarring the planes in their dives. Almost literally hanging forward against their shoulder harnesses, Davis and Shaw had *Shokaku* well in their sights at 2,500 feet, while J. W. Trott and H. D. Jones in the back seats watched for the Zeros they knew would be near. *<continued next page>*



"Finally, at 2,000 feet, the pilots tugged their manual bomb releases, closed the dive brakes, and pulled out of the nearly three-mile plunge with a momentum which took them straight through a group of planes circling the carrier.

"*Shokaku* had made a 60-degree right-hand turn during Davis' dive from 7,000 to 2,000 feet, and while it didn't throw off the pilots' aim by much, it was just enough. Both bombs hit close aboard the starboard side, Davis' 500-pounder missing by perhaps five feet. Shaw's bomb was close to his skipper's, 15 to 20 feet from the starboard quarter. The two SBDs passed so close to their target on the pullout that Jones in Shaw's Dauntless counted 20 planes on the flight deck." (from **The Dauntless Dive Bomber of World War Two**.)

By the time Fletcher did receive word of the main Japanese force, it was too late to divert the *Saratoga* strike from the *Ryujo* to the larger carriers. Felt's planes had split up to attack from two directions. Kirn and his scouts come in from the northwest while Shumway took six bombers to 16,000 feet and came in from the northeast. During the 15 minutes that it took to maneuver the planes into position, no fighter opposition was encountered and the ships below seemed surprisingly inactive.

Just about the time the first SBDs began their dives, the *Ryujo* began to turn into the wind and launch its Zeros. Felt remained at high altitude to observe the attack, and right from the beginning he was worried about the outcome. The ship's turning might throw off the pilots' aim, especially as it intensified the wind drift factor. As the first ten bombers went in, they scored ten misses. Now Felt had to redirect the other bombers from their attack on other targets. Having given the order for all bombers to attack the carrier, Felt finally decided that he would have a try himself.

Pushing over into his dive, Felt flew through an accurate barrage of antiaircraft fire which blew off his radio mast, but he kept his crosshairs dead center on the *Ryujo*'s flight deck and placed a 1000-pounder right through the center of the carrier, slightly port and aft of dead center. Shortly after that, an Avenger managed to put a torpedo into the carrier after several aborted attempts at torpedo runs.

Meanwhile, VB-3 Lieutenant Sid Bottomley and his group of seven SBDs made high altitude pullouts and resighted on the *Ryujo*. This group consisted of experienced dive bombers. Bottomley and four others of his group had participated in the Midway attacks, and

now they went back to work. Attacking from different directions, the seven bombers struck from 15,000 feet and scored three direct hits and four near misses. That was the end of the *Ryujo* which was headed for the deep. As it turned out, this was the sixth and last carrier sunk by the SBD Dauntless, and the last carrier sunk by American aircraft for two years.

As they came out of their dives, many of the bombers encountered heavy fighter opposition. One, Ensign W. A. Behr was attacked at 1,200 feet by two Zeros, one from the right and one from the left. Turning to engage the fighter on the right, he was hit 14 times by the fighter coming up behind him. He was able to escape by diving and making for the "deck." Diving out of pursuit and hugging the deck was one of the most successful tactics employed by the American fighters against the vastly superior Zero. Behr made it back despite encountering three more Zeros later on.

Still flying were Lieutenant (jg) R. M. Elder and Ensign R. T. Gordon who had launched later with five Avengers from Torpedo Eight. They were flying to investigate a report of a large Japanese force about 200 miles northwest. An hour after their takeoff, at around 1800 hours, they spotted the ships and the Avengers concentrated their attack on one of the large cruisers, but without success. Elder and Gordon went after what they identified as the battleship *Mutsu*. "Their aim was good—better than their recognition—as the 'battleship' was in reality the large seaplane carrier *Chitose*. She was closely bracketed by both bombs resulting in heavy flooding which nearly capsized her." (from **The Dauntless Dive Bomber of World War Two**.)

As the first wave of *Saratoga* pilots headed back after their successful attack on the *Ryujo*, Japanese planes were attacking the *Enterprise*. The *Saratoga* remained several miles away and was not attacked. Despite a fierce resistance by the AA batteries and the 51 Wildcats forming the CAP, about 24 Japanese dive-bombers got through and laid three direct hits on the *Enterprise*, killing 74 men, damaging the decks, and wrecking the 5-inch guns. Although damaged by the bombs, the *Enterprise* damage control, which had improved greatly due to the lessons learned on the *Lexington*, quickly got her operational, but she had to go back in for repairs that lasted for two months after the Battle of the Eastern Solomons.

Also attacked was the *North Carolina*, but she was able to shoot down or drive off 14 bombers with her gunfire. An expected second attack never materialized, however, as the second wave of Japanese planes failed to find the carrier force.

Just before the Japanese attack on the *Enterprise*, the last of the American attacking forces was launched. At this time, it wasn't known that the *Ryujo* had been sunk, so these pilots flew off but were unable to contact their target. While some of the planes jettisoned their torpedoes and headed back to the task force, Lieutenant Turner Caldwell of Scouting Five, unsure of the fate of the *Enterprise*, decided to land the eleven SBDs he led at Henderson Field on Guadalcanal. They were able to signal their intention to land despite the lack of radio communications, and the marines set out kerosene lanterns to mark the runway. This was the beginning of a hard month-long stay on the hotly contested battleground of Guadalcanal.

Back at the 'Sara,' there was considerable reason for celebration. In the successful attack on the *Ryujo*, not a single pilot or plane was lost. Even though the actual hit rate of 11 percent was

Enterprise in the Eastern Solomons

Poseidon and Aeolus had arranged a striking setting for this battle. Towering cumulus clouds, constantly rearranged by the 16-knot southeast tradewind in a series of snowy castles and ramparts, blocked off nearly half the depthless dome. The ocean, two miles deep at this point, was topped with merry whitecaps dancing to a clear horizon, such as navigators love. The scene—dark shadows turning some ships purple and sun illuminating others in sharp detail, a graceful curl of foam at the bow of each flattop, the long bow of *North Carolina* (a recent arrival from the Atlantic), *Atlanta* bristling like a porcupine with antiaircraft guns, heavy cruisers stolid and businesslike and the destroyers thrusting, lunging and throwing spray—was one for a great marine artist to depict. To practical carrier seamen, however, the setup was far from perfect. Those handsome clouds could hide a hundred vengeful aircraft; that high equatorial sun could provide a concealed path for pouncing dive-bombers; that reflected glare of blue, white and gold bothered and even blinded lookouts, and made aircraft identification doubtful. Altogether it was the kind of weather a flattop sailor wants the gods to spread over the enemy's task force, not his own. (from **The Two-Ocean War**.)

considerably below the performance achieved at the Coral Sea and Midway encounters, this was still something to be happy about. That well-deserved jubilation was only to last a few days, however, as the *Saratoga* was hit by torpedoes from the Japanese sub I-26 just a few days later, about 260 miles south of Guadalcanal. It took three months to repair her.

The following day, marine dive bombers from Henderson Field found the Tokyo Express and bombed the flagship *Jintsu* and destroyed the transport *Kinryu Maru*. Shortly afterward, B-17s flying out of Espiritu Santo dropped three bombs on a destroyer as it was attempting to evacuate the survivors of the *Kinryu Maru*. The destroyer sank, and for the first time, high-altitude bombing had scored a hit on the Japanese forces at sea, much to the surprise of both sides. (B-17 crew had consistently claimed hits before this, so sources may disagree whether this was, in fact, the first time such an event occurred.)

Many people tried to analyze the reasons for the low hit rate, and some even advocated shifting from dive bombing to horizontal bombing. However others, including the experienced flight leader, Max Leslie, felt that the dive bomber pilots needed more practice against moving targets. He advocated more shore-based training.

After the Battle of the Eastern Solomons, three of the most successful dive bomber squadrons were withdrawn from combat—Bombing Three, Bombing Six, and Scouting Five. These three squadrons participated in whole or in part in the sinking of all six Japanese carriers in 1942. Some of their pilots elected to stay in combat, however, and signed up with new squadrons.

Tactically, the Battle of the Eastern Solomons was not an overwhelming success for either side, but strategically, the Japanese failed in their objective to open the seas around Guadalcanal and eliminate the American carrier presence there. In terms of raw "score," the Americans lost a few planes and the use of the *Enterprise* for two months. The Japanese lost a small carrier and at least five airplanes with additional damage to the seaplane tender *Chitose*.

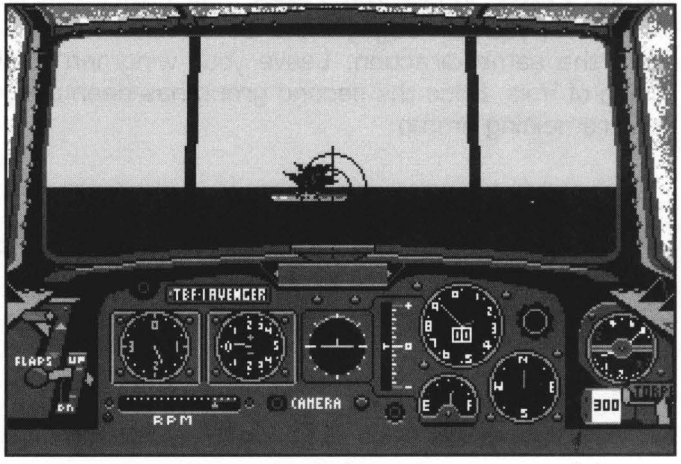
EASTERN SOLOMONS MISSIONS

U.S. EASTERN SOLOMONS #1

Fly a torpedo bomber in your attack on the light carrier *Ryujo*. Sink this carrier to prevent her from launching attack planes at Guadalcanal.

Difficulty: Hard

Strategy



Line up on the carrier before releasing your fish.

You start at 5,000 feet. Your mission is to torpedo the light carrier *Ryujo* which is directly in front of you. Follow your wing leader to the target. As he dives to attack altitude, follow him. Watch your speed and make sure you don't overrun him. As you approach the target, watch for the Zekes. If they fall behind you, make sure to man the rear gunner's seat to fight them off. You are approaching the target from the stern. Make sure the carrier is lined up dead center on your gun sight. Watch your speed and altitude. Once the warhead is released, increase your speed to 100% and maneuver away from the AA flak. Continue to monitor the location of any remaining Zekes and man your rear gunner's position when necessary.

JAPAN EASTERN SOLOMONS #1

You are flying CAP in your Zeke in defense of the *Ryujo*. If you can keep the U.S. planes busy and save the carrier, then the Carrier Striking Force can sink the main U.S. carriers.

Difficulty: Moderate

Strategy

Just shoot down the enemy. There's not that much else to say.

U.S. EASTERN SOLOMONS #2

You're flying CAP in your Wildcat fighter in defense of the *Enterprise*. Japanese Val dive bombers are approaching with fighter escort. Intercept them.

Difficulty: Moderate

Strategy

You start at 15,000 feet. You and your wingman must take out the the attacking Val dive bombers which are approaching directly in front of you. The first group of Vals is escorted by two Zekes. Ignore the Zekes, and attack the first group of Vals. Once the Vals are destroyed, you can dogfight the Zekes for a while. A second group of Vals is approaching from the same direction. Leave your wingman to the Zekes and fly toward the second group of Vals. Once the second group has been destroyed attack the remaining Zekes with your remaining ammo.

JAPAN EASTERN SOLOMONS #2

It's time to avenge the debacle at Midway. Escort a group of dive bombers as you try to sink the *Enterprise*.

Difficulty: Hard

Strategy

Again, make sure your bombers get through. Keep the enemy CAP busy.

U.S. EASTERN SOLOMONS #3

Fly your Avenger torpedo bomber as a fighter when you are faced by a group of Japanese bombers.

Difficulty: Moderate

Strategy

You start the mission at 500 feet; the Val dive bombers are directly in front of you. Watching your speed and altitude, engage the Vals from behind. Watch out for the rear tail gunners of the Vals. Use your dogfighting skills to shoot them down.

JAPAN EASTERN SOLOMONS #3

Your Val just dropped a bomb on the U.S. fleet. Now, enemy torpedo bombers approach. Avoid their guns as you escape to the north.

Difficulty: Moderate

Strategy

You start the mission at 500 feet after just dropping a bomb on the *Enterprise*. As you escape to the north, two groups of enemy torpedo bombers are approaching head on. Increase your RPMs to 100% and engage the enemy aircraft. Attacking the enemy from the side, and slightly behind, will give the best odds of destroying the enemy without getting damaged by the rear gunners of these aircraft. Once the first group is destroyed, head for the second group using the same strategy as you did with the first group.

U.S. EASTERN SOLOMONS #4

Carry out a bombing run on the Japanese Support Group protecting the main Carrier Striking Force. A strong attack on this group by you may force the Japanese to retire.

Difficulty: Easy

Strategy

You start at 15,000 feet. Your mission is to bomb the Japanese support group directly in front of you. The Zekes are below you and they are not a threat until you complete your dive bomb mission. Use the pan mode to find the closest ship in front of you. Alter your course so that you when you begin the dive bomb attack you'll be diving on it amidships. Once you've completed your attack, maneuver away from the flak and watch out for the attacking Zekes. Use your rear gunner position whenever the Zekes attack you from behind.

JAPAN EASTERN SOLOMONS #4

You're a long way from your home carrier, protecting the Support Group ships. American dive bombers approach!

Difficulty: Easy

Strategy

You start at 5,000 feet over your support group ships. Increase your RPMs to 100% and begin climbing. The enemy dive bombers are approaching from your left out of view. Turn approximately 180 degrees and fly towards the closest ship in the support group. As the dive bombers begin their dive you must shoot them down before they release their bombs. Use you 20mm cannons to shoot at them from a distance. As you get closer, use your smaller caliber machine guns to finish them off.

Chapter 13
The Guadalcanal Battleground: The Battle of the Santa Cruz Islands

AFTER THE BATTLE OF THE EASTERN SOLOMONS

The struggle to control Guadalcanal (code-named Cactus) continued on through September and October. The conditions on the island were thoroughly miserable. The jungle abounded with insects such as giant ants, huge wasps, spiders, leeches, and malarial mosquitoes. The visibility and mobility through the jungle was practically nil, and, to make matters worse, poor sanitation caused many cases of severe dysentery and other diseases. The marines ate C-rations or dehydrated foods supplemented by captured Japanese rice when they could get it. Many of the Japanese troops, struggling through the jungle without proper supply lines, were forced to eat coconuts, roots, and moss.

For the marines, almost nightly bombing and the need for constant alertness took its toll. Pilots and planes were in constant operation, although losses of both were heavy. Guadalcanal quickly became the focus of a concerted Japanese strategy to regain the island.

On September 13, an attacking force led by Major General Kawaguchi Kiyotake led a substantial number of Japanese troops against Henderson Field. Although his orders were to reconnoiter first to determine if the attack was warranted or if reinforcements were needed, the General decided to attack at the marine perimeter at night. Lieutenant Colonel Merritt Edson led the defenders from the elite Raider and Parachute battalions. Kawaguchi's men attacked twelve times and were beaten back. Shouting "Banzai!" or "Marine you die!" the attackers hurled themselves against the automatic weapons and howitzer shells of the defenders, and by morning, half the attacking force had been killed. The rest had retreated into the jungle. A fifth of the marine defenders were killed or wounded in this battle at a position which became known as "Bloody Ridge."

On September 14, Admiral Turner sailed from Espiritu Santo to bring reinforcements to Guadalcanal. Despite the ever-present threat of air and submarine attacks, the convoy successfully delivered the Seventh Marine Regiment and all their equipment to the island on September 18. The operation was successful; however, the carrier *Wasp* was surprised just after turning into the wind and launching its planes. A Japanese submarine had managed to sneak in and deliver four torpedoes at close range. Three of them hit and the *Wasp* was lost carrying 200 men and 46 aircraft to the bottom with her.

After taking several torpedo hits, the* Wasp *was abandoned and sunk later on.

Despite the reinforcements, it seemed that the Japanese would soon be able to overrun the airbase on Guadalcanal if further measures weren't taken. Admiral Ghormley, in charge of all the operations for Task One, had plans to capture Ndeni, an island in the Santa Cruz island group. Therefore, he was unwilling to throw all his forces into Guadalcanal, but agreed to send additional combat troops.

Setting sail on October 9, the carrier *Hornet* and the brand-new fast battleship *Washington* headed out from Nouméa with several cruisers and destroyers under the command of Rear Admiral Norman Scott. This small fleet accompanied two transports carrying the U.S. Army's 164th Regiment of the America Division. Scott was hoping to attack the Tokyo Express, and had trained his forces in night fighting, studying the methods used in previous Japanese night attacks.

On October 11, Scott encountered part of the Japanese escort in a confused battle in which neither side was sure who they were firing on. One minute after opening fire, Rear Admiral Scott

"One learns more from defeat than from victory." [Sometimes]

ordered a cease-fire, thinking he might be firing on the destroyer Duncan. However, his cruiser commanders ignored the order, certain of their identification. Meanwhile, Admiral Goto thought the ships firing on his might be from Rear Admiral Joshima's Reinforcement Group, and turned his ships to the right. In the confusion, Scott discovered his error and gave the Resume Firing order. Despite all the confusion, the Americans managed to sink a Japanese destroyer, knock another out of the war for some time, and mortally wound Admiral Goto. One of the American cruisers, the *Boise* (also known as the "Galloping Ghost"), was also damaged and had to spend several months in repairs.

Although the Battle of Cape Esperance marked the first time the Americans had pulled off a successful night attack at sea against even forces, the element of surprise figured heavily in their success; not to mention the fact that they had radar and their opponents didn't. Later night battles would show that the Americans still had a lot to learn.

Cape Esperance Summation

"Norman Scott fought the Battle of Cape Esperance with cool, determined courage, and, despite an intricate countermarch, never let the situation deteriorate into a melee. He became the hero of the South Pacific during the short month that remained of his valiant life. Unfortunately, because it is human to conclude that the result justifies the means, some fallacious conclusions were drawn from the Battle of Cape Esperance: that the single-column formation was all right, and that American gunfire could master any night battle situation. Actually, Scott's disposition was dangerously unwieldy and prevented the destroyers from exploiting their proper weapon, the torpedo. And because the surprised enemy did not get off his usual torpedo attack, that was assumed to be no longer a serious threat. One learns more from defeat than from victory." (from the **Two-Ocean War**.)

Two days later, the transports delivered 3,000 men along with jeeps, trucks, ammunition, and other supplies to the beaches of Guadalcanal. In addition, there were hundreds of cases of candy bars which quickly became the objects of barter among the troops. They traded Japanese artifacts for Hershey bars, even going so far as to manufacture Japanese flags if they had nothing else to trade. Samurai swords were the big ticket trade item.

The new troops hardly received a hospitable welcome to their new assignment. For the next two nights, Japanese battleships entered "Sleepless Lagoon" (as the marines called it) and shelled Henderson Field, destroying the runway for more than a week, wrecking planes, and making life miserable for the inhabitants. This shelling, the most intense so far endured by the defenders at Henderson Field, was described by many as the worst experience of their lives. After the battleships had finished, two Japanese cruisers continued to dump another 2,000 shells on the island for two nights more.

"Then, By God, Find Some!"

On the morning of October 15, after two nights of shelling from the battleships in "Sleepless Lagoon," Japanese troop ships were sighted unloading at nearby Tassafaronga, but the helpless marines could only watch until General Geiger, the air commander at Henderson Field, informed that there was no aviation fuel, yelled, "Then, by God, find some!" And the marines scoured the island for gas, finding cached barrels in swamps and jungles, siphoning gas from disabled B-17s, and eventually had enough to launch ten planes against the troop transports. With additional support from Espiritu Santo, army, navy, and marine pilots were able to make sure that the Japanese troops had a rough landing. They caused three transports to beach and be written off, and caused widespread problems for the Japanese until the task force finally withdrew.

Also on October 15, Admiral Nimitz issued this statement: "It now appears that we are unable to control the sea in the Guadalcanal area. Thus our supply of the positions will only be done at great expense to us. The situation is not hopeless, but it is certainly critical." However the Americans saw it, the situation was not much better for the Japanese at the time.

Meanwhile, Guadalcanal was not the only focus of attention for the American forces. Even though it had become clear that this island was somehow the focal point of conflict between the Japanese and the Allies, the Joint Chiefs of Staff were also busy building up their air offensive against Germany. They were unwilling to dilute their effect by sending too much air support to the Pacific. Therefore another battle for equipment was shaping up while various leaders were critical of each other for their lack of effectiveness. Army General Arnold in particular was critical of the navy's apparent unwillingness to risk its ships in confrontation with the Japanese fleets. Others felt that the navy had failed to support the efforts at Guadalcanal sufficiently.

Another severe problem at Guadalcanal was the need to supply the island's forces. There were no nearby ports sufficient to provide the necessary services and goods needed. The nearest ports were in Nouméa, and the nearest with the needed facilities were in New Zealand. Ships from San Francisco, ready to make the 6,400 mile journey, had to wait for escorts. The whole situation was a logistical nightmare. In fact, the whole subject of logistics was undergoing some scrutiny as the two-front war strained the resources of the American military.

The strain was even more apparent among the men in the Pacific. "Fear, horror, fatigue, anxiety: that was Guadalcanal for the navy as well as for the fliers, marines, and army troops." (from **Eagle Against the Sun**.) Added to the endless days at sea was the constant fear of sudden torpedo attack, a shelling from an unanticipated ship, or a bombing attack by aircraft. Several ships were lost with all or most of their crew. Some sank almost immediately after being hit by torpedoes. Others exploded violently. The situation was becoming more and more dire as time passed.

Meanwhile, both General Hap Arnold and Admiral Nimitz visited the scene during September and agreed that Admiral Ghormley, overworked and harassed, had reached a point of despair and had to be relieved. Nimitz, stating that "the critical situation requires a more aggressive commander," named Admiral Halsey to take over operations in the Pacific. On the "binnacle list" since May with severe dermatitis, Halsey was again fit for duty.

Halsey's reputation was extraordinary throughout the navy, and his appointment was able to instill new confidence into the troops fighting for control of Guadalcanal. The first thing that Halsey did was cancel the Ndeni operation in the Santa Cruz islands and direct that all efforts go into supporting Guadalcanal. Meanwhile, debate raged as to where the resources should go. The situation in the Atlantic theater was not certain, and the Joint Chiefs were wrestling with the overall puzzle when President Roosevelt helped resolve the dilemma for them by issuing a strong statement to "make sure that every possible weapon gets into that area to hold Guadalcanal."

Evil-Smelling, Worthless... Priceless

"The goal of the Japanese Army on Guadalcanal and the Navy a few hundred miles to the north was Henderson Field. The Army was to capture the field. Carrier planes would fly in at once. Caught between the carriers and Henderson, U. S. naval forces would be sunk or forced away and the U. S. Marines, cut off, could be mopped up. The evil-smelling, worthless, priceless island would be back in Japanese hands, the threat of an American counter-attack up the Solomon chain ended, and the march to cut the U.S.-Australian life line could be resumed. But first it was necessary to capture Henderson Field." (from **The United States Navy in World War II**.)

While the Americans were busy trying to deal with their logistics of supply and command, the Japanese had continued their buildup on Guadalcanal. Now, in the middle of October, they were ready for another offensive.

The plan was for General Hyakutaka's troops to attack from the west and south while the Combined Fleet waited to attack any Allied ships that tried to come to the island's aid. Once the airfield was in Japanese control, planes from the fleet's carriers would fly in.

The offensive was delayed as units commanded by Lieutenant General Maruyama Masai hacked their way through the jungle and into position. The second time the attack was postponed, word failed to reach Major General Sumiyoshi Tadashi, and he launched an attack from the west along the Matanikau River on October 23. However the marines were ready and knocked out Sumiyoshi's nine light tanks and drove the Japanese into retreat.

While the marines were busy thwarting the Japanese attack from the west, the main forces were gathering to the south. The defenders had only minimal defensive units in place there—the First Battalion, Seventh Marines under Lieutenant Colonel Lewis "Chesty" Puller who had gained considerable fame among marine personnel. Flanking Puller to the left were the new units of the 164th Infantry.

In a driving rainstorm around midnight the Japanese attacked in force. The fighting was bloody and intense, but the two units held, losing only about 200 men to the Japanese losses of more than 1,000. Another attack followed the next night as reserves were mobilized to shore up the defense, and again the Japanese were beaten back. Some estimate that more than 3,500 men died in those two nights. However, the Americans still held Henderson Field at the end.

THE BATTLE OF THE SANTA CRUZ ISLANDS

While the bloody battles were taking place on Guadalcanal, Vice Admiral Kondo Nobutake waited for word of Japanese success. On October 25, some Japanese soldiers broke through the American lines and mistakenly reported that they had taken Henderson Field. That was the signal Nagumo and Nobutake were waiting for. As the Japanese fleet turned south, they learned that an American task force was headed toward them. Scout planes had spotted Kondo's carriers and the Americans took position north of the Santa Cruz Islands. On October 26, the two carrier forces clashed.

Kondo had four carriers—the *Shokaku, Zuikaku, Junyo,* and *Zuiho*—along with an impressive force of ten cruisers, thirty destroyers, and a vanguard fleet of battleships and cruisers. The Americans had only the *Enterprise,* recently returned from repairs at Pearl Harbor, and the *Hornet* along with some support vessels, but the Americans were definitely out-gunned. The loss of the *Wasp* had made a difference, and the other carrier, the *Saratoga,* was still in Pearl Harbor for repairs after her run-in with the Japanese torpedoes.

Despite the overwhelming odds, both the *Hornet* and the "Big E" had experienced airmen leading their fighter and bomber squadrons. Veterans of Midway and Eastern Solomons were among the pilots and crew ready to go out against this latest Japanese threat. This experience and the commitment of these aviators would make a decided difference in the outcome of the battle at hand.

Hit the Target

On the night of the 25th, Commander John Crommelin, air officer aboard the *Enterprise,* met with his pilots.

"Commander John Crommelin called his pilots together in the wardroom. While they sat in their open-collared khaki along the green-covered tables with coffee cups before them and the smoke flattening out among the trunks and cables on the overhead, he gave them the straight, true, vigorous words they needed to hear. They had all been carefully and thoroughly trained, he told them; they knew how to drop a bomb and have it hit. And he damned well expected them to do just that. The safety and success of the Marines in their long, miserable struggle for Guadalcanal now depended 100 per cent on how well the Big E's pilots did their duty. There was no room for waste, no excuse for misses. If they were going to get out there and miss, it would have been better if they had stayed back in the States and given good pilots their bunks and a crack at the enemy. Crommelin's Alabama accent thickened as he made his last point and the lights on the low wardroom overhead glittered on his sandy, graying hair. He hoped no one had any illusions about being overworked. The men in that room were a major part of all that stood between the Japanese and Guadalcanal. And on Guadalcanal depended the war in the South Pacific. He would use them however and whenever necessary and the better they were the better their chances. He would use them over and over and over again. Now they were to rest and knock those sons-of-bitches off the face of the earth in the morning." (from **The United States Navy in World War II.**)

ATTACK. REPEAT, ATTACK.

"Before daylight on the twenty-sixth—while early breakfast was being served to sailors with faces still creased from their bedding, while aircraft were being armed and rechecked and pilots briefed—a message was received from the headquarters of the commander, South Pacific Force, at Noumea. It was in a familiar style. Three words:

ATTACK. REPEAT, ATTACK.

Only one man could have sent it and the Big E's men knew him well. Bill Halsey was back in the war." (from **The United States Navy in World War II**.)

Twenty minutes before dawn on the 26th, the first 16 Dauntless dive bombers took off from the decks of the *Enterprise*. This was the beginning of the Battle of the Santa Cruz Islands, next to Midway, the most destructive and the bloodiest carrier battle of 1942.

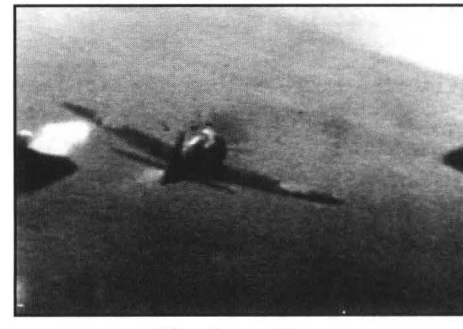
No Silver Lining

"The sun rose at 0523 on a fair day—low broken cumulus clouds scattered over half the sky, the ocean rising and falling in a gentle swell, a languid 8-knot breeze from the southeast scarcely raising ripples on the sea's smooth surface. It was weather to the taste of dive-bomber pilots who could lurk in the clouds, but to the distaste of antiaircraft gunners—no cloud has a silver lining for them." (from **The Two-Ocean War**.)

For once, the weather was favorable, with scattered clouds between 1,500 and 2,000 feet suitable for the scouts to hide in, but good visibility. At 0730, Lieutenant V. W. Welch and Lieutenant (jg) B. A. McGraw found the advanced Japanese battleship force, but did not locate the carriers which were sailing in a separate formation north of the battleships.

At 0750 hours, Lieutenant Commander James R. Lee sighted the first carriers and immediately climbed to a higher altitude to relay the information to the *Enterprise* before making an attack run. However Lee and his wingman had been spotted and Zeros quickly intercepted them. Hit in the windscreen, Lee was nevertheless able to get a clean shot on a Zero which exploded from the effects of his twin .50 caliber guns. Lee's wingman claimed two Zeros shot down, and the two scout planes ran for the concealment of nearby clouds. However, they were unable to shake the Zeros and return to attack, so they had to head back to the *Enterprise*, already low on fuel.

Meanwhile, Lee's report had been heard by other scout pilots, and soon two sets of scouts were headed toward the scene. The first to arrive, pilots Ward and Carmody, encountered the same Zero screen as Lee had encountered and were finally forced to retreat. However, Lieutenant Birney Strong and Ensign Charles Irvine, originally heading for the battleship group, altered course and navigated to the position of the



Chasing a Zero.

Waiting Game

At 7:30 A.M. the "dits" and "dahs" of Welch's contact report beeped loudly into the Big E's code room with the unhurried clarity of a communications drill:

TWO BATTLESHIPS, ONE HEAVY CRUISER, SEVEN DESTROYERS. LATITUDE 8 DEGREES 10 MINUTES SOUTH, LONGITUDE 163 DEGREES, 55 MINUTES EAST. COURSE NORTH. SPEED TWENTY KNOTS

Bareheaded and short-sleeved among the Big E's helmeted and life-jacketed bridge crew, Admiral Kinkaid paced and fretted. The admiral stopped for a minute to watch the big bedspring antenna of the air-search radar slowly sweeping the sky, then walked to the rail and looked for the twentieth time at the loaded SBDs and TBFs crowded together on the flight deck. Ducking through the crowded pilothouse to the starboard wing of the bridge, he lifted the binoculars hanging around his neck and saw a bigger deck load of planes ready on the *Hornet* ten miles away. This was the Big E's day to search and follow with a small strike. The real punch was on the *Hornet*.

At ten minutes of eight Kinkaid heard what he had been waiting to hear. The radios in the coding room came alive again and the watch could recognize the firm clear hand of Chief I. A. Sanders, flying with Lieutenant Commander J. R. "Bucky" Lee, skipper of Scouting Ten:

TWO CARRIERS AND ACCOMPANYING VESSELS, LATITUDE 7 DEGREES 5 MINUTES SOUTH, 163 DEGREES 38 MINUTES EAST

The Admiral stepped into the Flag Plot and looked closely at the chart. Two hundred miles to the northwest. The bright flags soared out of their bags to the yard arms and the shutter clattered on the 36-inch signal searchlight trained on the *Hornet*. Force speed went up to 27 knots and the bows swung into the northwest. (from **The United States Navy in World War II.**)

carriers, though they were coming at the maximum range they could possibly manage. Strong was a veteran of several encounters already, and had scouted the *Ryujo* during the Battle of the Eastern Solomons, but hadn't attacked from the scouting position. This time, no doubt with Crommelin's words still ringing in his ears, he was determined not to let another opportunity get by him.

While the Zeros were chasing off Ward and Carmody, Strong and Irvine came in unnoticed. At 0830, they tipped over into their dives and sighted on the 11,200 pound carrier *Zuiho* (sister of the *Shoho* which had been sunk at the Coral Sea). Without anything to impede their flight, Strong and Irvine came down over the wooden flight deck and laid their 500-pound bombs along the stern, wrecking the flight deck and twisting up the aft portion of the ship. The *Zuiho*, which had already launched its planes, was out of the rest of the battle.

Once they had come out of their dives, however, the defenses came alive and the two Dauntlesses had to flee the heavy AA fire and the sudden appearance of the Zero CAP. Using a weaving technique like the Thach weave, the two Dauntlesses worked together to keep heavy

Diving on the *Zuiho*

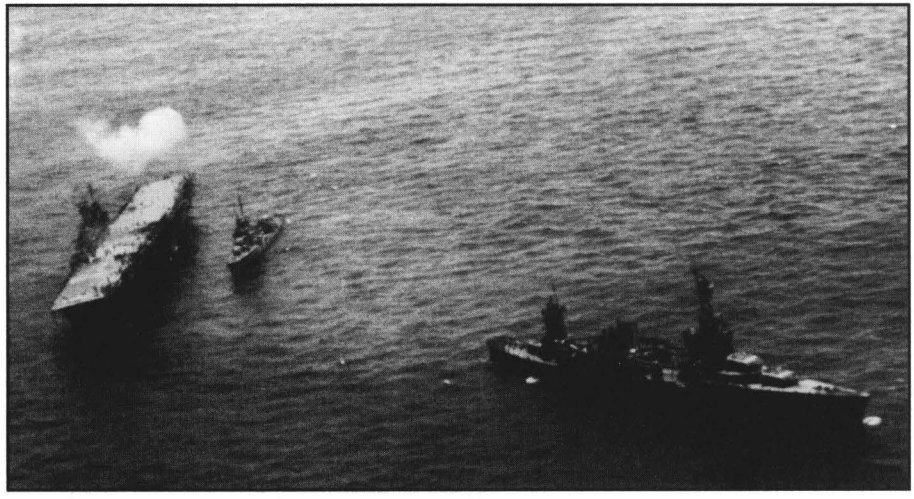
"Directly up-sun from *Zuiho*, the nearest carrier, [Strong] patted his head to Irvine, pulled up, split his flaps and rolled into the long dive that since December had become the purpose of his life. A thousand feet behind, Irvine followed down. Still there were no Zeros. Unruffled by any flak the dive was a smooth as a training exercise. The gunners lay on their backs wondering at the empty sky, waiting for the bouncing of the AA while the two pilots leaned forward, sweating with pure concentration, an eye pressed to the tubular scope where every pressure of right hands and toes moved the crosshairs on the expanding deck. There was time to notice that both decks were empty, that the enemy air groups had been launched. In succession at 1,500 feet their left hands went down and forward, found the release handles and pulled. It was done. And as the bombs fell away the AA came up and the Zeros closed from all directions. But it was too late. Both bombs plunged into the enemy flight deck near the stern and opened it wide with two splintering blasts rapidly followed by a pouring of black smoke." (from **The United States Navy in World War II**.)

fire going at the Japanese planes. Though they shot down a few Zeros, Irvine also took damage in the tail section. Finally, after a 45-mile chase, they found a cloud to hide in, and when they emerged, the Zeros were gone. They landed with barely a drop of fuel remaining, but safely on the deck of the "Big E."

Meanwhile, the Japanese were attacking the *Hornet* while the *Enterprise* was hidden in the weather. As the Vals dove on her through the flak barrage, one bomb hit the starboard side of the flight deck. Then, a Japanese squadron commander whose plane had been hit, made a suicide attack, hitting the stack, bouncing off, and blasting through the flight deck where two of his bombs exploded.

Next, the stricken carrier was hit by two torpedoes from low-flying Kates. All power was lost and the carrier was dead in the water. But the attack was not yet complete as three more bombs hit the decks and another suicide flight as a flaming Kate plowed into the forward gun gallery and exploded near the forward elevator shaft. Of the 27 planes that attacked the *Hornet*,

only two returned, but the Americans had paid the biggest price as they had lost one third of their Pacific carrier strength.

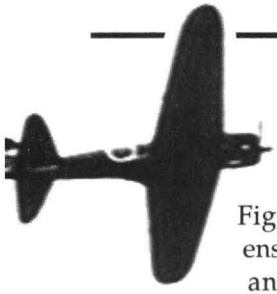


Listing to port, the* Hornet *can't be saved. (Official Navy Photo.)

During this first part of the engagement, the Americans were able to shoot down seven Zeros and one Kate in addition to disabling the light carrier *Zuiho*. But the battle was just beginning.

On receiving the reports from the scouts, the two American carriers launched a total of 73 planes in essentially uncoordinated missions against the carriers. There was little time for planning for it was known that the Japanese had already launched attacks of their own. In fact Lieutenant Commander Gus Widhelm's VS-8 group spotted the enemy strike now more than 60 miles after launch, but neither strike force engaged the other. There wasn't enough fuel for additional air battles.

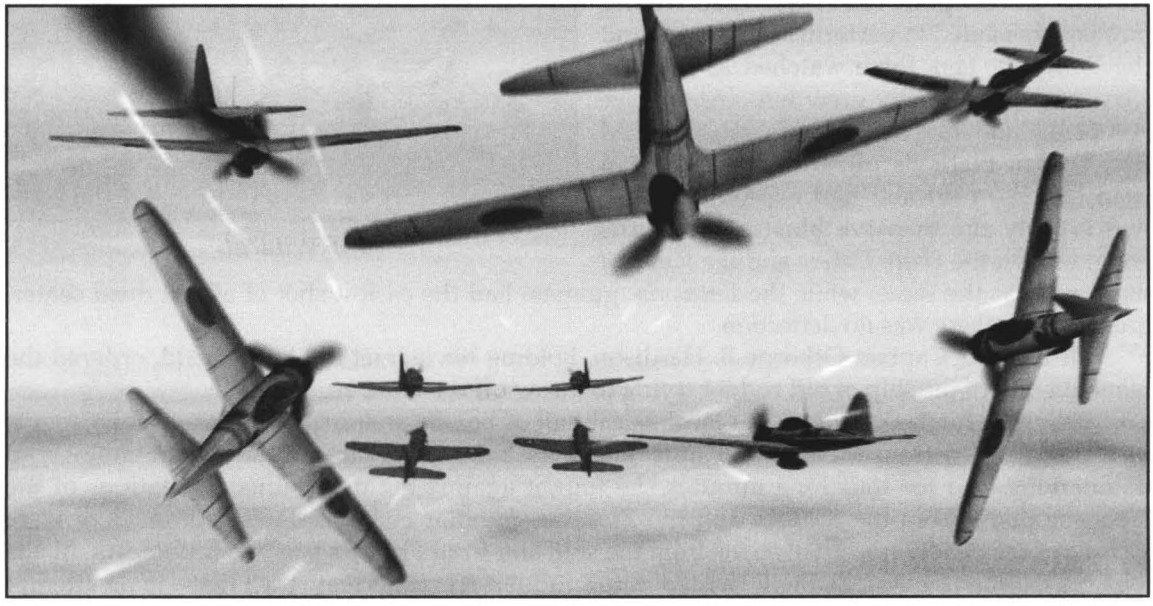
Finally, she's torpedoed by a U. S. destroyer. (Official Navy Photo.)



However, the Zero fighter escort spotted a smaller force originating from the *Enterprise* and surprised them from up-sun splashing three Wildcats and three Avengers, damaging another of each. In this group were the experienced fighter pilots Lieutenant Commander Jimmy Flatley, skipper of the "Grim Reapers" of Fighting Ten and Lieutenant John Lepla, both winners of the Navy Cross. The ensuing air battle was fierce, but essentially favored the Zeros. The F4F was heavy and required an altitude advantage, which its weight could quickly convert to speed. Here the Zeros had intercepted the Wildcats when they were escorting the bombers, caught at a slow speed and constant altitude, they could not even dive to gain speed and fight at low altitude.

Two pilots, with heavily damaged planes, were able to hold off the Zeros by executing the Thach weave, but when one of their engines seized up, that maneuver was no longer possible. Now Big E's force was reduced to four Avengers, four Wildcats, and three Dauntlesses. Moreover, the fighters had ejected their external fuel tanks before engaging the Zeros and now lacked the range to reach the carriers.

Widhelm, meanwhile, encountered the battleship group, but hadn't yet spotted the carriers when his planes were attacked by Zeros. However, Widhelm, who had missed most of the action at Midway, was determined to get his chance this time. He and his pilots pressed onward and five minutes later sighted the carrier group. He immediately spotted the damaged *Zuiho*, which was smoking, and the *Shokaku*. Once again, as at Coral Sea, the *Zuikaku* was hidden in a squall. Widhelm led his 15 SBDs in to the attack, but before they could get into bombing position, they were attacked by Zeros. Grouping close together, the Dauntlesses created a formidable barrier of



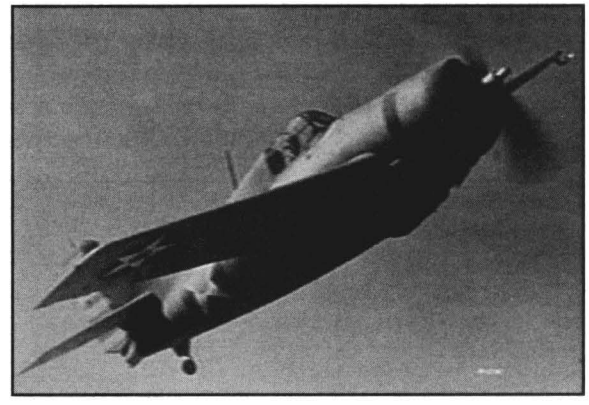
fire power both front and aft, while the Zeros continued to attack in waves. For 25 minutes, the battle raged at 12,000 feet. Widhelm's plane was hit early and began to leak oil, but he continued to lead the formation. Three SBDs were shot up and only one of them made it back to the *Enterprise*.

Finally, before they could begin their final dive, Widhelm's bomber finally gave out as the engine froze. He jettisoned his bombs and made a water landing, escaping the attack of a lone Zero by the determined efforts of his rear gunner.

Meanwhile, another experienced veteran, Lieutenant Vose, took over for Widhelm and led the eleven remaining Dauntlesses into their dives. The *Shokaku* tried to take avoiding action, but the bombers were relentless. Though some witnesses, including Widhelm floating in a life raft, counted as many as six hits, at least three direct hits were confirmed. The *Shokaku* was out of action for nine months following the attack. Widhelm and his gunner were rescued two days later.

One unusual souvenir of the battle was collected unexpectedly. As Lieutenant Vose's bomb exploded on the *Shokaku's* wooden flight deck, a piece of it had blown right into Lieutenant Fred Bates' open cockpit as he followed Vose in his own dive. After the battle, Bates presented this bit of charred wood to Vose.

By 1100 hours, radar on the *Enterprise* had identified an approaching force of Japanese planes. The *Hornet* was already out of it, and it looked like it might be the Big E's turn. Fighters were scrambled, but were unable to intercept the approaching enemy planes, partly because of poor direction and inappropriate use of the radar aboard the ships in coordination with the fighter CAP.



F4F Wildcat.

At any rate, the attack was coming. Newly developed radar-assisted firing mechanisms failed to perform as expected, and the *Enterprise* task force watched as the tiny silver specks gradually grew into enemy dive bombers. Suddenly, all the ships' guns opened fire. One of Flatley's pilots thought the San Juan had been hit and had exploded, but it was simply the massive blast of her guns going off. On the *South Dakota* and the *Portland* the story was the same, while the *Enterprise* gunners had the easiest shot of all. At dead center, ground zero, there was no deflection.

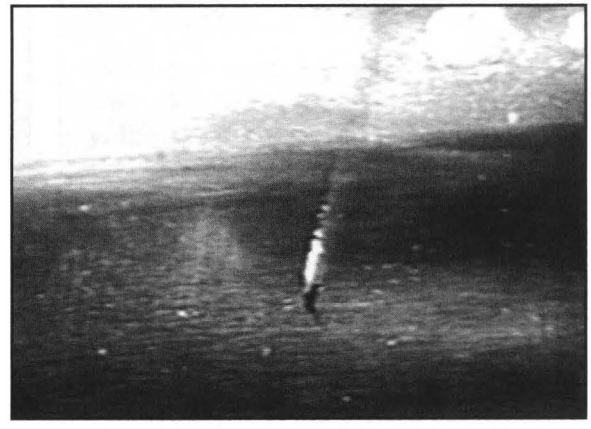
Meanwhile, Captain Osborne B. Hardison, holding his helmet in his left hand, ordered the maneuvering of the ship at full rudder trying to throw off the bombers' aim.

Enterprise lurched through the mechanical hail of bombs and crashing planes while spouts of water erupted from the sea. Her hull rang with hammer-on-anvil blows from submerged detonations, and for four long minutes she fought against the determined predations of the Japanese pilots from the *Shokaku* and the *Zuikaku*—familiar enemies. Fully half of them were victims of the deadly tracery of shells from the ship and from Flatley's frustrated Wildcats. As the men braced themselves, the Big E twisted at full rudder—first this way, then that—in an attempt

The Big E takes a near miss.

to avoid the Japanese' deadly cargo. Repair crews waited below in the dim red battle light, listening, and feeling for the blast that would propel them into action to save the ship.

At 11:17, it came. John Crommelin stood on the open bridge, watching the incoming dive bombers. Suddenly he commented, "I think that son-of-a-bitch is going to get us." Then a 550-pound bomb, flung from the bottom of the Japanese attacker, flew through the forward overhang of the flight deck just to port of the center line, but it wasn't done yet. It flew another fifteen feet, then passed through the fo'c'sle deck and out the portside of the ship. Its delayed action fuse, detonated it in the air close to the port bow, not deep in the decks of the ship as it was intended to do. The blast sent fragments flying into the ship's hull, leaving holes that ranged from a quarter of an inch to a foot in diameter. It also claimed the life of Sam Davis Presley, an aviation machinist's mate, who was shooting from the rear guns of a Dauntless when the aircraft was blown overboard.



The attacking plane was shot down.

Another bomb hit quickly after the first near the forward elevator, breaking in half on the deck. Each half of the bomb then took a separate course, the forward part crashing through two more decks and wiping out Repair Party Number Two. The aft portion of the bomb exploded in the hangar deck and destroyed two spare planes.

Meanwhile, the *South Dakota* shadowed the Big E, covering her with accurate fire that knocked many planes out of the sky, but the Vals kept coming. At nineteen minutes past eleven a muffled explosion aft of the island knocked everyone to the deck. The carrier shuddered from bow to stern, any point on the deck vibrating through a foot and a half every second for several seconds. The vibrations caused machines and equipment to be torn from their mountings, and on the flight deck, planes edged toward the starboard side, and some went over. The damage was widespread, and the crippled carrier began trailing oil—a perfect path for the enemy to follow. By 11:20 the attack appeared to be over.

The *Porter* Takes a Fish

From up above, just minutes after the battle, Dave Pollock was flying CAP when he looked down to see a destroyer at full stop below, rescuing a downed pilot. Then, a hundred yards off the beam, he noticed an erratic movement just beneath the water. It was a torpedo, circling near the unwary destroyer. From his vantage point, the 'fish' was clearly visible, but he knew the men on the ship would not spot it easily. Knowing that the jittery gunnners would open fire on any plane that came near them, Pollock nevertheless dove down toward the endangered vessel. Flying through a hail of tracers from the *Porter* and other nearby ships, Pollock repeatedly strafed the water around the torpedo, hoping to blow it up, or at least call attention to it. Finally, the gunners recognized the markings on his plane and ceased fire, but it was too late. Her screws churning up the water in an effort to move away from the torpedo, she took a solid hit amidships. Pollack could only fly back to his buddies. Later, the *Porter* was sunk by the *Shaw*.

The *South Dakota* and Tom Gatch

Part of the defensive screen attached to the Enterprise was the new battleship *South Dakota*, "freshly provided with dozens of the new 40-mm antiaircraft guns, was commanded by one of the Navy's most remarkable characters, Captain Thomas L. Gatch. No ship more eager to fight ever entered the Pacific; for the skipper, by constant target practice on towed planes, ignoring lapses in spit-and-polish, and exercising a natural gift for leadership, had welded his green crew into a splendid fighting team. They 'looked like a lot of wild men,' said one of his officers, and they all adored Tom Gatch." (from **The Two-Ocean War**.)

Mistaken Identity

At 11:27 a lookout reported a periscope off the starboard beam, and the Big E leaned hard to put her stern to it before it was identified as a porpoise.

At 11:44 despite a periscope warning, the Big E had a bigger problem. The Japanese torpedo planes were arriving, somewhat late, to finish what the bombers had started. Fifteen Kates bored in a low altitude. The first Kate was hit by the screening gunfire at while still three miles out, several more following. But five of them launched their fish and turned for home. Four more were still approaching as the captain ordered, "Right full rudder!" as three torpedoes approached on a perfect line to hit amidships. The sudden turn saved the *Enterprise* as the three torpedoes shot harmlessly by, missing by ten yards. More quick maneuvering was necessary, however, as the carrier turned to avoid the destroyer Smith which was contending with the effects of a crashed aircraft on its bow. Then another hard right to avoid another torpedo.

Now five more Kates came low from astern, determined to lay their tin fish into the carrier. Hardison kept the *Enterprise* turning to starboard to present a narrow target as the Kates lined up and three of them were shot down by return fire. A fourth plane released its torpedo badly, just before crashing into the sea, but the fifth got in a good drop. Still, it was not difficult to avoid just the one torpedo and the Big E was safe again.

Protecting the Big E—Swede Vejtasa

Swede Vejtasa had a big day. As the leader of a division of four F4Fs, he took his aircraft aloft 9:00 A.M. to, joining 12 other Wildcats already on CAP. The action began when he found himself climbing hard to intercept a Val before it could begin its dive on the *Hornet.* His shooting was good, though, and the Val went down. Unable to go after any of the other bombers before they had made their attacks, he led his group after two that were turning for home. Both were shot down and Swede got one of them. Now his orders were to circle at 10,000 feet and watch for torpedo planes.

Following another group, he headed northwest just after noon and spotted eleven bogies—Kates flying in V formations with a two-plane section at the rear. Two of his group had spotted the Kates and were already attacking. Diving in on the torpedo planes, Vejtasa and and his wingman each flamed one, then continued up behind one of Vic formations as they were entering a cloud. Swede became separated from his wingman in the turbulence of the cloud, but stayed on the tail of the Japanese aircraft. He had watched a lot of planes get away while circling at 10,000 feet earlier in the day, and he was angry about it. With determination he flew close to the left-hand plane and gave it two short bursts from directly astern. He kicked rudder and came in behind the leader, catching the Kate's rudder with his first burst. As pieces of the rudder flew past him, he gave a second burst, and the leader was flamed. Without hesitation, Vejtasa slid in behind the remaining aircraft and peppered it with bullets from nose to tail. It went down, again in flames. So far he had had a pretty good day.

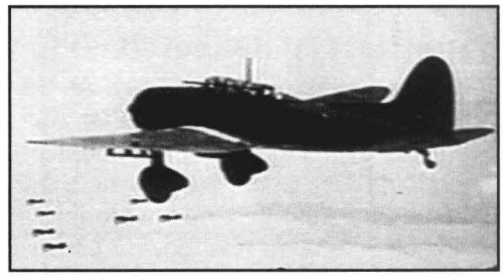
In the wisps of the cloud, Swede spotted another Kate and took an angle on it, but didn't see it blow up. The Kate dropped away, into the AA fire. But Swede later emptied his ammo into another Japanese plane at 3,000 feet before he was done. It was a good day's work—two Vals and five Kates, with possibly one more. Of the eleven attacking Kates, Vejtasa and his wingman accounted for six, three dropped their torpedoes early, and, according to Jimmy Flatley, "the other two were so demoralized that they were ineffective."

With masterful timing and skill, Captain Hardison had avoided nine torpedoes aimed at his ship, but without Vejtasa's effort, the *Enterprise* might still have met the same fate as the *Hornet* with eleven more Kates to contend with.

Later, at around 12:21, another attack of twenty or more dive bombers came in but was turned away by the concentrated, and by now experienced gunfire from the task force. Shortly after that, another attack of Vals, this time 15 of them, came flying in as the radar officer was up on the mast trying to repair the damaged radar antenna. Again the gunners fought off the bombers, who landed a few on the support vessels *South Dakota* and *San Juan* but were unable to inflict any further damage on the Big E.

Returning to the *Hornet*, the remains of Widhelm's original group found the carrier in poor shape and turned to the *Enterprise*. Though they executed the day's recognition signal—left-hand turns, dipping the port wingtip twice—the jittery *Enterprise*, already damaged by Japanese bombs, opened fire with antiaircraft guns, fortunately missing the incoming American planes. Finally, the pilots were able to land, though there was considerable damage aft and the middle elevator was jammed in the down position. To make things even more challenging, the forward

end of the carrier was smoking, but each pilot flew up the wake and hit the rear arresting wires successfully, then maneuvered their planes carefully around the open elevator hole.

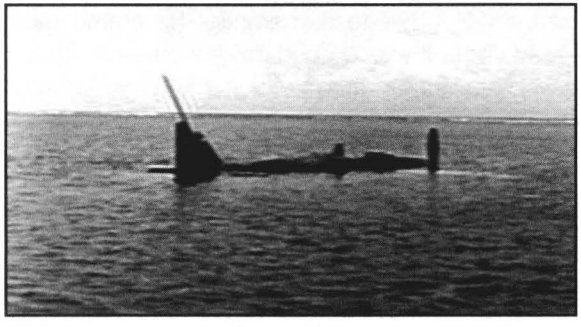


Japanese Val dive bomber.

At this point, the battle odds had changed. Originally four carriers against two, now there were two Japanese carriers against the damaged *Enterprise*. However, there were a couple more chapters to write in this battle. The small strike force from the *Enterprise* had found the Kongo class battleship, *Kirishima*, and had pushed over to bomb the 32,000-pound vessel. Despite two direct hits and one near miss, the *Kirishima* continued on without any noticeable damage.

Communications problems prevented the second wave from the *Hornet* from finding the carriers, and they eventually attacked the cruiser *Chikuma*. Two bombs destroyed the bridge while a third exploded belowdecks. Two other bombs narrowly missed, and the *Chikuma* was out of the battle.

After the attack on the *Chikuma*, the successful pilots headed back toward the *Hornet*, but found her dead in the water. Flying over to land on the *Enterprise*, they encountered another wave of Japanese planes and fought them in a wild free-for-all air battle, claiming three Vals and a Kate. They finally landed aboard the *Enterprise* at 1330 hours.



A downed Zero.

Despite the fact that the Americans had been forced into an unequal encounter, they were successful in several respects. First, the latest (and last) major Japanese carrier offensive to retake Guadalcanal had been thwarted. Second, from a dismal 11 percent success rate in the Eastern Solomons battle, the SBDs had scored a formidable 40 percent hit rate. In addition, they claimed 23 Zeros, three Vals, and two Kates, though they probably shot down fewer Zeros than they claimed.

As 1942 came to an end, the American fleet was in a weakened state in the South Pacific, but they had obtained most of their objectives. In addition, the American dive bombers had caused a great deal of destruction to the Japanese fleet, sinking (alone or with help) more than a quarter of a million tons of Japanese ships, including six carriers, a battleship, three cruisers and four destroyers.

Many other battles were to be fought before Guadalcanal was secured, and, in fact, there was Japanese resistance on the island all the way to the end of the war in 1945. But the four carrier battles and the many other naval and land-based battles that occurred in 1942 proved sufficient to stop the Japanese march across the Pacific and start the successful U.S. counteroffensive.

BATTLE OF SANTA CRUZ MISSIONS

U.S. SANTA CRUZ #1

The main Japanese carrier force has been sighted off to the north. Dive bomb their carriers and you may force them to give up their plans to reinforce Guadalcanal once and for all.

Difficulty: Hard

Strategy

You start at 10,000 feet. Several Zekes are patrolling at your altitude. Dogfight as any Zekes as you can before you begin your dive bomb attack. Use your rear gunner when the Zekes come at you from behind. Once the sky is clear at your altitude, maneuver your plane to the flat top and begin your dive bombing attack. Once you complete your attack, maneuver away from the flak and dogfight the remaining Zekes.

JAPAN SANTA CRUZ #1

The Americans have located your carrier force! U.S. SBDs approach looking to stop your advance on Guadalcanal. Fly your Zeke to foil their attack.

Difficulty: Easy

Strategy

You start at 20,000 feet. The approaching SBDs are behind you just over your carrier and to the left and below of you. Your wingman is closer to the group of two SBDs over your carrier. Concentrate your efforts on the two approaching groups to your left and below you. With your height advantage, try shooting down the enemy in a diving side attack avoiding the rear gunners of the SBD's. You'll need to watch your damage in this mission. Getting shot up on attacking the first group can seriously hamper your efforts in taking out the second group.

U.S. SANTA CRUZ #2

The Japanese have located your carriers. They are determined to inflict a crippling blow to the carrier force defending Guadalcanal. Protect the *Hornet* and intercept the incoming bombers.

Difficulty: Impossible?

Strategy

You start this mission at 20,000 feet. Several groups of Vals approach your carrier group directly in front of you at 15,000 feet. Maneuver your Wildcat close behind the closest group of Vals and engage them. Maintain your altitude during the engagement and conserve your ammo. Continue engaging the Vals until they are severely damaged or destroyed. Once the Vals have been destroyed, drop your altitude and engage the incoming Kates below you. In order to beat this mission, you must have pinpoint accuracy in your shooting, avoid damage, and conserve your ammo.

JAPAN SANTA CRUZ #2

Launched from the *Shokaku*, strike back at the U.S. fleet. Torpedo the carrier *Hornet* as your comrades come in with a high level bombing attack.

Difficulty: Hard

Strategy

You start this mission at 5,000 feet in your Kate torpedo bomber. Follow your wing leader to the target, keeping an eye out for enemy fighters. As the carrier comes into view it will be the farthest ship in the center. You'll also notice that your dive bombers have already commenced an attack on the carrier. Once you are close enough to see some detail of the carrier, drop your speed to around 100 knots, reduce your altitude to below 500 feet and line your gunsight up to amidships of the carrier. If you encounter fighter resistance on your way in, jump to the rear gunner's seat to drive them off. If you take damage, increase your RPMs to 100% so you don't stall and plummet into the water. Once you release your torpedo, turn any direction to avoid flak, level off, and assume the rear gunner's position.

U.S. SANTA CRUZ #3

Strike again at the Japanese carrier force. You fly a torpedo bomber in an attack against the *Shokaku*. Sink it so its planes can't attack your carriers.

Difficulty: Moderate

Strategy

You start at 5,000 feet. Follow your wing leader to the target carrier which is directly in front of you and smoking. Once you can see the carrier detail drop your altitude and begin your torpedo attack. Once your warhead is released, start a gradual climb and increase your RPMs to 100%. Jump into the rear gunner's seat and fight off the attacking Zekes.

JAPAN SANTA CRUZ #3

The American attack has not relented. Save the *Shokaku* from the approaching US torpedo bombers.

Difficulty: Impossible?

Strategy

You begin this mission at 20,000 feet. The approaching bombers are behind and in front of you at 15,000 feet. First attack the second group which is directly in front of you and below. You must act quickly and take out this group in one pass. Next attack the first group, which is nearing the carrier. Increase your speed to 100% RPMs to catch this group before it begins it dive bombing run. After you have taken out the first group, turn and attack the third group which is approaching the carrier. Conserve your ammo and watch your altitude in this mission. Try to shoot down the bombers before they begin their attack to maintain your altitude.

U.S. SANTA CRUZ #4

Fly your fighter in an escort mission, protecting damaged torpedo bombers as they return home from their torpedo attack on the Ryujo.

Difficulty: Moderate

Strategy

Start this mission at 500 feet protecting a group of damaged TBFs on their way home. Three groups of Zekes are approaching directly in front of you. Turn 180 degrees and drop back to the rear of the TBFs. The Zekes will try to attack the TBFs from behind. Keep your Wildcat between the Zekes and the TBFs. Use your dogfighting skills to shoot them down.

JAPAN SANTA CRUZ #4

Your Zeke has intercepted a group of damaged torpedo bombers returning from an attack on your fleet. Down them, and their Wildcat escort.

Difficulty: Moderate

Strategy

You start at 5,000 feet with the damaged TBFs directly in front of you. The Wildcat escort will be the undamaged planes in front and to the rear of the formation. Shoot down the Wildcats first. Then concentrate your efforts on the damaged TBFs. Make sure you don't get damaged when fighting the Wildcats. Otherwise, you'll have a difficult time catching up with the TBFs and destroying them.

Chapter 14
Some Conclusions on the War in the Pacific

Professor Williamson Murray

The fighting in the Solomons and the desperate struggles that had taken place in the Battles of the Coral Sea and Midway decimated the U.S. Navy. By late 1942 American naval forces in the Pacific were virtually out of carriers. The Marines who evacuated Guadalcanal in the aftermath of the desperate struggle had been worn down almost to complete exhaustion, but their Japanese counterparts were in even worse shape: most of them were dead.

In fact the two opponents in the great battles that took place around Guadalcanal and in New Guinea had, by spring 1943, exhausted the naval and air forces with which they had begun the war. And in many ways the Americans had paid a heavier price in aircraft and ships than had their opponents in the first seventeen months of the conflict. But at this point, the great strength of the American economy began to come into play. Beginning in summer 1943 a new *Essex* class (fleet) carrier and a new *Independence* class (light) carrier began to arrive in Pearl Harbor each moth. Similarly, the American aircraft industry was turning out aircraft of all types in unbelievable numbers. As one historian of the Combined Bomber Offensive has noted, the Americans were producing four-engine bombers as if they were candy bars. The numbers were so great that American air forces (navy as well as army) were able to fight the Japanese to complete exhaustion, while at the same time fighting the Germans in the great air battles in the Mediterranean and over Central Europe.

The naval and air forces that the United States deployed to the Pacific in the first year and a half of the war had come through these terrible battles of attrition in better shape than when these battles had begun. The same could not be said for their opponents. As was to be the case in the air war in Europe, new American crews would now come to the combat theaters with well over three hundred hours of flying time, while their opponents often possessed less than a third of that total. Almost none of the superbly trained pilots with which the Japanese had begun the war were still alive; more and more of the experienced Americans were now surviving, raising the whole level of experience of those who fought the air war.

At sea the United States Navy grew to awesome dimensions. By fall 1944 its main battle fleet of fast carriers and new battleships was almost as large as all the rest of the navies in the world combined. This huge fleet was supported by a vast array of support vessels so that ships need only return to harbor for complete overhaul. As a result, the American high command rotated the fleet headquarters: Fifth Fleet under Admiral Raymond Spruance and Third Fleet under Admiral Halsey. While one headquarters was at sea commanding a major operation the other was in Pearl planning the next. The ships remained at sea and the tempo of operations never let up on the Japanese.

Ironically, for political reasons (namely the lack of trust between General Douglas MacArthur and the United States Navy, as well as the fact that President Franklin Roosevelt distrusted the political connections that MacArthur possessed), the Americans mounted two great drives in the Pacific. MacArthur drove from Australia up along the northern coast of New Guinea to eliminate the great Japanese naval base at Rabaul.

On the other hand, the navy, beginning in fall 1943, mounted a great amphibious campaign across the Central Pacific. In this campaign the U.S. Marines and U.S. Army executed a number of landings on Japanese held islands, while the great Pacific fleet stood off and kept the Japanese at bay. Some of these landings involved heavy casualties, but their net effect was to isolate large numbers of Japanese garrisons on islands that were no longer significant since the Japanese no longer possessed the air power to utilize those bases.

In October 1944 the two great drives came together with the landing on the island of Luzon in the Philippines. In the Battle of Leyte Gulf, during which the Japanese battleships came within a whisker of getting in among the American transports, the Americans destroyed the bulk of Japanese naval power. By now the Japanese had been reduced to the desperate expedient of using the aircraft as suicide (Kamikaze) attack craft. They would inflict dreadful casualties on the Americans for the remainder of the war, but in no fashion could they even delay the inevitable results.

In February 1945 the Marines seized Iwo Jima in a horrendous blood bath, and then in April Okinawa fell to American marines and soldiers with equally heavy casualties. Japan was in an absolutely hopeless position: her merchant fleet lay at the bottom of the Pacific, largely the result of the ferocious submarine campaign mounted by the U.S. Navy; nothing remained of her fleet; the nation was besieged and on a starvation diet with none of the raw materials necessary to keep the economy in functioning condition; and finally, great fleets of American B-29s were battering Japanese cities one after another in a bombing campaign even more ferocious and effective than that launched by Bomber Command against Germany's cities. The end came, mercifully (*though horribly—Ed.*), in August 1945 with the dropping of two atomic bombs; even the Japanese militarists could no longer argue in favor of continuing the war.

If the end of the war underlined the massive power of the United States in comparison to what the Japanese held, one should not forget how evenly matched the two opposing forces were during the first year of the war. In the battles from the Coral Sea to the seemingly never ending battles around Guadalcanal, the two nations fought each other to exhaustion. Nevertheless, it was the performance and achievements of American sailors, marines, soldiers, and airmen in those early battles that determined the course of the rest of the war.

Chapter 15
Battlehawks 1942
Ranks and Medals

AMERICAN RANKS (NAVY)

Cadet	0 (new pilot)
Ensign	100
Lieutenant (jg)	250
Lieutenant	700
Lieutenant Commander	1,000
Commander	1,500

AMERICAN MEDALS:

Cumulative pilot scores

Air Medal	450	1,750*
Distinguished Service Medal	850	1,250*

*second award

Single mission

Distinguished Flying Cross	50
Silver Star	100
Navy Cross	150
Congressional Medal of Honor	200

Japanese ranks:

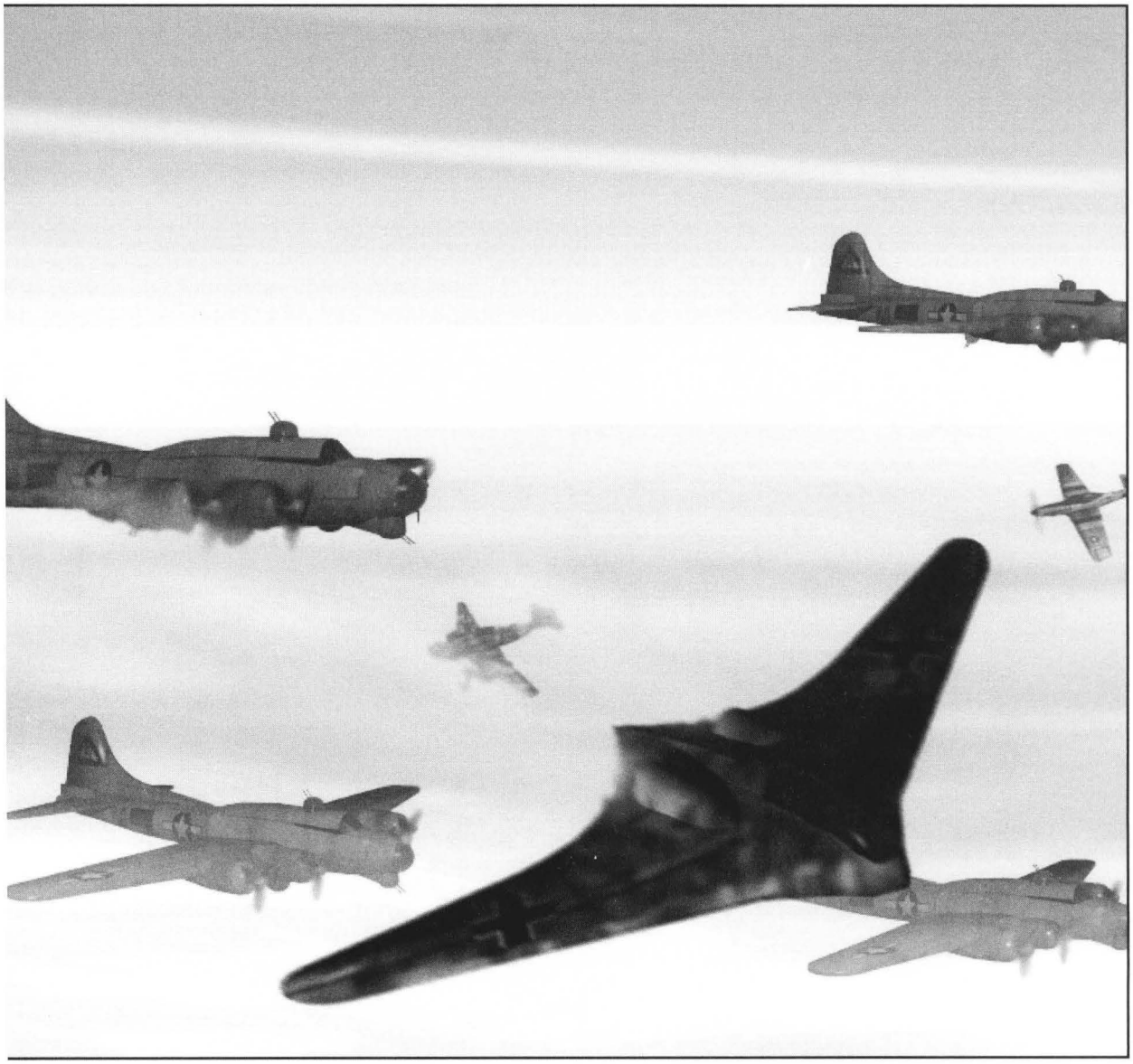
Acting Lieutenant	0 (new pilot)
Lieutenant (jg)	200
Lieutenant	400
Lieutenant Commander	850
Commander	1,500

Japanese medals (cumulative scores only)

Coral Sea	300
Midway	400
E. Solomons	300
Santa Cruz	300

PART III
SECRET WEAPONS OF

THE LUFTWAFFE



Chapter 16
1941

In the following chapters, we've provided a very brief look at some of the events of the war in Europe following the Battle of Britain, particularly in the period between 1943 and 1945 when the American Strategic Bombing effort took place. We have tried to add some information about the events occurring in other parts of the war in Europe—in the Soviet Union and Africa, for instance, and to provide a framework for understanding the events of the times. This is necessarily an incomplete history. There are literally thousands of books about World War II. It is not our intention to write a complete history. However, we feel that you'll enjoy the missions and campaigns contained in Secret Weapons of the Luftwaffe *even more if you have a sense of the overall picture as you do so.*

AFTER BRITAIN: THE EASTERN FRONT

After the Battle of Britain, whatever opportunity or possibility Hitler had to conquer England slowly faded away. The famous London Blitz had failed to destroy England's will, and Hitler feared a two-front war against Britain to the west and Russia to the east. Britain seemed contained, however, and Hitler decided to worry about Britain later. And so, turning his attention toward Russia, Hitler and the Reich began a long, slow march toward defeat. However, in the Führer's mind the war was already won, and to be certain, Germany's defeat was not immediate. The *Wehrmacht* continued its implacable march toward the complete domination of Europe and the Mediterranean, coming ever so close to achieving its leader's twisted goals.

London survived the Blitz.

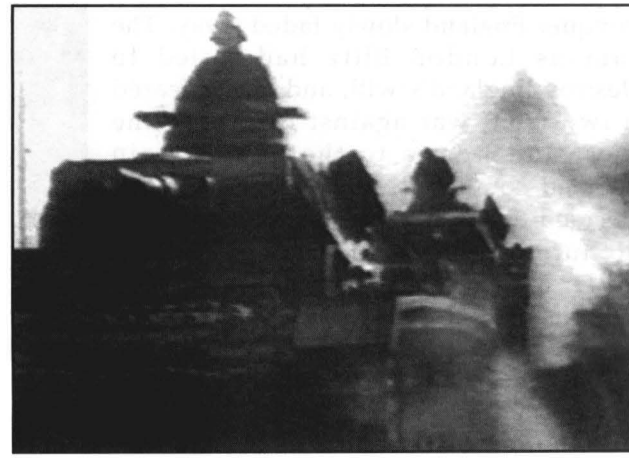
Even though Hitler's course in 1941 did eventually lead to his defeat, he was still riding the wave of popularity that had brought him to this position. There was no thought of defeat in the

Nazi high command, among the common soldiers, or among most of the populace. In fact, many of Hitler's troops were coming to think of him as more than just a military leader. They worshiped him with a fanatic loyalty, and believed the Nazi rhetoric fervently. As one British interrogator wrote in a report after interviewing captured submarine officers and crew, "The prisoners were all fanatical Nazis and hated the British intensely, which had not been so evident in previous cases. They are advocates of unrestricted warfare, and are prepared to condone all aggressive violence, cruelty, breaches of treaties and other crimes as being necessary to the rise of the German race to the control of Europe." Hitler's troops were ready to carry out his vision without compunction or the slightest distraction of conscience.

In June, July, and August of 1941, German armies penetrated rapidly into Russia, conquering a territory greater than that of Germany itself. Over the next few months they continued to drive forward across the seemingly endless expanses of the Soviet Union until, eventually, they had arrived at the proverbial doorstep of Moscow—only to be stalled by the elements and by the incredible industrial capacity of the Soviets, protected as it was, by distance, from Germany's reach. The next year, the Germans were again beaten by the winter and the seemingly endless resources and resistance of the Russians. The brutal winters of 1941 and 1942 stopped the German advances, first on Moscow and then on Stalingrad and the Grozny oil fields, and the seemingly endless resources of the Russians finally started to take their toll. Even though the Soviets would lose millions of men and thousands of planes, there always seemed to be more where they came from. By the time the Americans did arrive, Hitler would have suffered two great defeats at the hands of the weather and the stubborn Russian people.

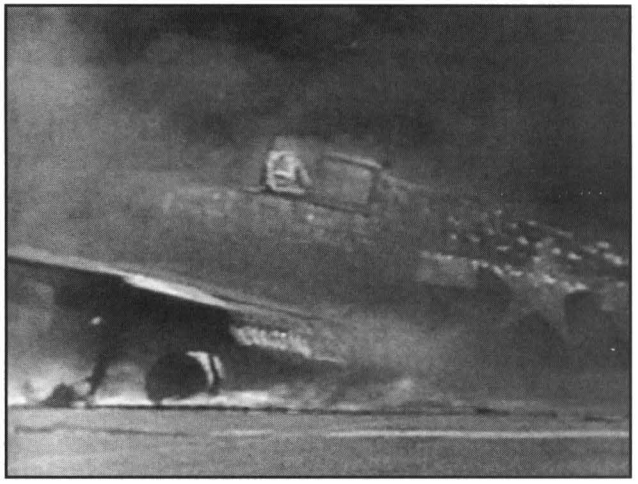
THE WINTER OF 1941

Despite early successes, not all went smoothly even at the early stages of the Eastern campaign. Hitler seemed to follow a plan of his own, often born of some frustration or emotional reaction. His plans did not always meet with the approval of his general and war staff, but nobody told der Führer what to do, and he kept all his underlings in their places.



German tanks drove deep into Russia in 1941.

One of the areas of contention had been the need to drive toward Moscow. Hitler had had other ideas, and by the time he finally did acquiesce to the urgings of Brauchitsch, Halder, and Bock to move on Moscow it was too late. The order was given in September of 1941, but the necessary troops could not be brought into position until October, and then Hitler wanted to attack Leningrad simultaneously. But that wasn't all. He also wanted von Rundstedt



The Luftwaffe was able to destroy many of the Russian planes on the ground, just as they had previously done in Poland and elsewhere. But the Russians were not destroyed this time.

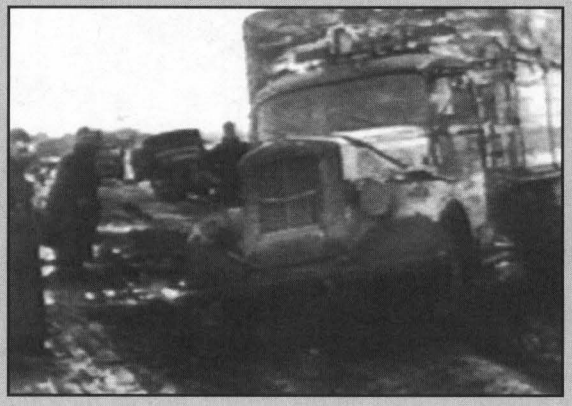
to clear the Black Sea area and move through the Maikop oil fields and on to Stalingrad. Moreover, as if a portent of the future, the first snow flurries fell on the Russian front only a week after the decision had been made, though no snow remained on the ground.

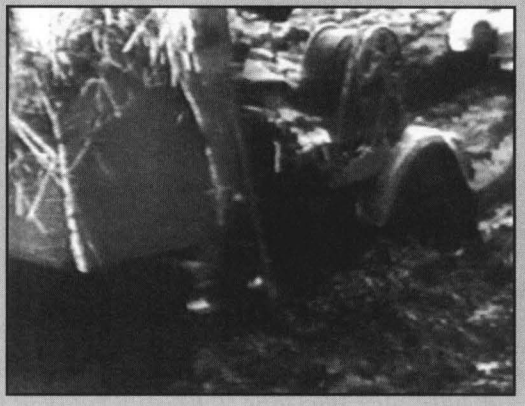
There were serious flaws to Hitler's plans, but nobody could make him change his mind. And the initial drive toward Moscow was an example of classic German military power. Trapping two of the Russians' armies between Vyazma and Bryansk, the Nazis claimed to have captured 650,000 Russian troops, 5,000 guns, and 1,2000 tanks. By the third week in October the Russians were within 40 miles of Moscow. Victory looked to be in sight.

Then the weather started to take over. First the rains came and, as Guderian reported, "the next few weeks were dominated by the mud." Through this mud slogged the tired German troops, dragging their guns and artillery, which seemed to be sucked into the wet earth and often had to be pulled by teams of horses.

But the mud was just the beginning. Early in October the snow had begun to fall, harbinger of an early winter. By early November, the temperatures plummeted and so did the German morale. Without proper winter attire, those Germans educated enough to know their history were reminded of Napoleon's disastrous winter march along the same path in 1812. Also in mid-November, the great World War I fighter ace, Ernst Udet, committed suicide, partly over his failures in the Eastern Front where the German air power had failed to carry out

The Other Soviet Army: The Russian Weather





The Mud

The mud bogged down everything. Vehicles slid off the road while boots were sucked right off the feet of the soldiers. The German machinery and morale sank, too.

The Cold

As the freezing weather hit, the German soliders were ill-prepared. Their boots, of thin leather, could not protect their feet from sub-zero temperatures. Their tanks, guns, and supply vehicles froze. Worse yet, many soldiers froze to death as well.

Russian men, women, and children digging a tank trap on the way to Moscow.

its objectives. Then, on his way back from the funeral, an even more promising Luftwaffe leader died in a transport plane crash—Werner Mölders.

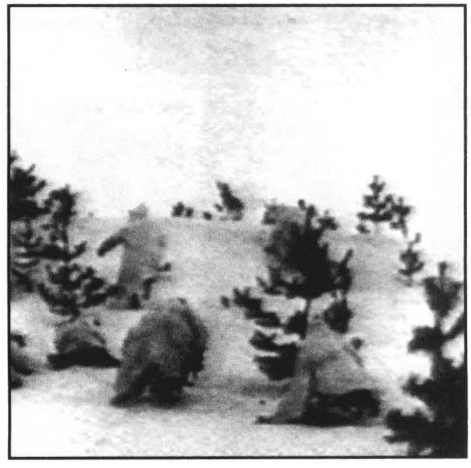
If the Germans were demoralized by the freezing winter, something had sparked an increased ferocity among the defending Russians. In one well-publicized incident, a single survivor in an anti-tank gun emplacement destroyed five German tanks despite being severely wounded. Meanwhile, German sentries who fell asleep at their posts were found frozen to death in the morning.

About the same time the Germans were enduring the bitter cold of the Russian winter, the British forces in North Africa began a counterattack on Rommel's forces in an effort to divert German troops and attention away from the embattled Soviets.

On December 1, the Germans mounted their final attack, convinced that it would cause the remaining Russian defenders to crumble. However, the only Germans to see the Kremlin that day were a group of advanced scouts who were forced out of Moscow's suburbs by the next day.

For the next four days, the Germans tried to break through the Russian lines, but could not. The weather crippled their machines and their troops were freezing, hungry, and tired. Everywhere they were held to a standstill, and eventually they had to admit defeat. But even as the German generals were finally resolving to pull back, the Russian general Georgi Zhukov launched a counterattack using seven armies and two cavalry troops—forces that Hitler had not even known of. This counterattack was the final blow, and, with their goal and ultimate victory once so close, the German armies now faced possible extinction.

Zhukov's ace-in-the-hole. The elite Siberian troops. Trained for the freezing conditions of the Russian winter, they pushed back the already exhaused German army.



Russian tanks worked better in the snow and cold.

Defeated German POWs see an end to their delusions of invincibility.

The German troops managed to retreat, but they had been thoroughly beaten. Many of Hitler's commanders were court martialed after that, and some even sentenced to death. As for Brauchitsch, he was sent into retirement following a heart attack. Hitler called him a nincompoop among other things. As to Brauchitsch's successor, there was some speculation, but the new commander of all the armies was to be none other than Adolf Hitler himself.

On the day after the Russian counterattack, one of the most significant moments of the war occurred. The date was December 7, 1941. The event: The Japanese attack on Pearl Harbor. The Americans had entered the war, whether they liked it or not.

THE WEST: AMERICA ENTERS THE WAR

The British, meanwhile, continued to build up their defenses while improving their long-range bombers. Although an all-out offensive against Germany was still out of reach, the British began to send bombing raids into occupied France and parts of Germany they could reach. Their newest bombers, the Lancaster and the Halifax, were capable of delivering huge payloads. At this time, the Americans weren't formally in the war, and only offered some aid in the form of the Lend-Lease program, supplying a few B-17 bombers to the harried English. However, as early as October of 1940, President Roosevelt had called for Americans to join in the defense of their country and promptly received more than 16 million registrations to the armed services.

The U.S. Congress had been trying to stay out of a war. Now they had no choice.

"A day which will live in infamy..."
—Roosevelt, Dec. 7, 1941

On December 11, 1941 Hitler declared war on America. One historian has called this "perhaps the greatest error, and certainly the single most decisive act, of the Second World War." Certainly, everywhere the German oppression weighed so heavily, the American entry into the war engendered renewed hope. Many thought the war would not last long.

"Now it is impossible for us to lose the war. We now have an ally who has never been vanquished in three thousand years."
—Hitler, Dec. 7, 1941

However, the Americans had their hands full in the Pacific. Until Germany actually declared war on them, Roosevelt had still retained the hope of keeping neutrality in Europe and avoiding a two-ocean war.

Eventually, after Pearl Harbor and the German declaration of war, the Americans had no choice. They were in the two-ocean war despite any misgivings, and only Japan's and Germany's utter defeat would end it for them. The U.S. started by scouting locations in England for their bombers and personnel. During 1942 and 1943, the American and British industries geared up to the most massive bombing effort ever seen—a day and night pummeling of key German cities and industries.

Meanwhile, the Soviets had begun to retake the territories that Hitler's *blitzkrieg* had so quickly overrun at the beginning of the war. Pushing the Germans rapidly back from Moscow, they regained control of more than 400 towns in six days of fighting. On December 11, the same day Hitler declared war on America, Churchill told the House of Commons, "In Hitler's launching of the Nazi campaign on Russia we can already see, after less than six months of fighting, that he has made one of the outstanding blunders of history."

"He has made one of the outstanding blunders of history."
—Churchill, Dec. 11, 1941

CONTEMPT FOR AMERICA

Apparently Hitler had nothing but contempt for America's military strength and capability. The lessons of the First World War had made no significant impression. However, he had attempted to keep the Americans at home for the first part of the war. His plan was to conquer Russia and all of Europe before turning his attention toward the U.S. The Germans reportedly even supported isolationists and bribed congressmen in their attempt to keep America neutral.

Hitler originally courted the Japanese, not with the intention of having them attack the Americans, or even the Russians, but to aid him against the British who had stubbornly refused to give up. By taking the British possessions and territories in the South Pacific and Far East, Japan could aid Hitler's cause, depriving the British of many of their resources.

Here's an odd sight. Prewar American Nazis. There were those in America who actually believed in Hitler.

In Hitler's mind, America could not be a threat if the Japanese controlled the South Pacific. They would not be able to sail their fleets safely, and would be unable to arm themselves and help England at the same time. Hitler believed that the opportunity was perfect to isolate America, then take it apart in due time.

Whatever his original plans, on April 4, 1941 Hitler had made a vow, seemingly conceived in the moment, to support Japan and to attack America should the Japanese enter a war with that country. Meanwhile, Japan signed a neutrality pact with Russia believing that Hitler was not going to attack the Soviets. Hitler had deliberately misled the Japanese Ambassador, and the Japanese subsequently signed the pact, which they were to keep throughout the war despite the exhortations of the Germans to help them when things got tough on the Eastern Front.

Despite Hitler's plans for them, the Japanese had their own priorities, and America was number one. And with Tojo's ascent to power in October, war seemed more and more inevitable. As we have seen in the previous section, a complex game was played up until the very moment of the attack on Pearl Harbor which marked the official entry of the United States into World War II. Some people believe that Hitler knew of the Japanese surprise attack, but more evidence points to the fact that the Germans were even more surprised than the Americans. Their reaction was different, of course.

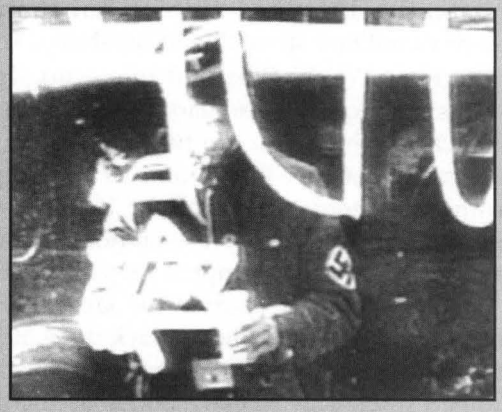
In Hitler's eyes, though he had long sought to avoid bringing the Americans into the war ahead of time, the Japanese attack was not altogether bad. Hitler believed that Japan's surprise attack was admirable and would bolster morale and relieve the tension of people who wondered when the U.S. would enter the war.

Hitler deliberated only a short time before declaring war on the United States himself. In fact, some reports indicate that he showed some haste in doing so in order not to be beaten to the punch by Roosevelt. Such a view is certainly consistent with his statement in his public declaration of war on December 11, 1941.

"We will always strike first. We will always deal the first blow!"

The Birth of the Nazi Atrocities

Hitler's intention to rid the world of Jews was a keystone to his hate philosophy. He had never made any secret that his was a political party based in violence and hate. As the Nazis increased their power, feeling invulnerable, they began one of the most systematic and inhuman campaigns of genocide in modern history.



It started with painting stars.

Even in the '30s, when Hitler took power, his hatred of Jews had been the core of his political dogma. At first, the persecution was simply a matter of stripping Jews of their rights and tormenting them with derision and disorganized violence. By the end of the war, that violence had reached a state of organization and brutality beyond the imagination.

Many of Germany's best intellectuals fled the country. Among the first was Albert Einstein who sought sanctuary in America where he warned of the coming of Hitler's reign of tyranny. Soon, many of those intellectuals who did not flee were systematically murdered or imprisoned—Jews and non-Jews alike. Hitler would not allow for any freedom of thought to interfere with his plans or form the seeds of a rival philosophy.

At the beginning of the war on the Eastern Front the German war machine appeared to be as unstoppable as ever, and the fanaticism and cruelty of the Nazi philosophy was evident in the murder and enslavements of thousands of Jews. For instance, in Roskiskis the Germans killed 3,200 Jews in a two-day murder spree. Others were forced to wear yellow stars and were banned from such simple rights as walking on the pavement.

The public hunting down of Jews was too visible, however, and several of the Nazi criminals, notably Adolf Eichmann and Judge Alfred Wetzel devised the plan of killing Jews en masse in mobile gas vans. The first experiment not only murdered 290 aged Jews, but the Germans even presented a bill to the surviving Jews of the town of Kalisz to cover the cost of "transport."

It ended at places like Belsen, with bodies...

And this was only the beginning, but, unfortunately, not even close to the end of the Nazi atrocities that have succeeded in converting the leaders of Hitler's regime from the role of warlords and would-be conquerors to the role of monsters whose ruthless and grotesque behavior defies imagination. In time,

and more bodies...

and the stench of brutality and death.

the numbers of Jews and others who didn't fit into the Nazi plan—who were part of Hitler's "Final Solution"—grew into the millions. They were all transported to death camps like Auschwitz where some, if able-bodied enough, were enslaved. The rest—the elderly as well as many women and almost all the children—were murdered by the tens of thousands. And those who were spared to slave labor were most often starved, beaten, and degraded—frequently murdered for the slightest transgression, real or imagined. Even if these prisoners had been animals, as the Nazis claimed, their treatment would have been horrifying. That they were, indeed, human beings, made it all the more ghastly. The death toll from the Nazis' systematic program of extermination reached over six million by the war's end.

Of course extermination wasn't all that happened. These people were often tortured, used for bizarre medical experiments, and all were completely stripped of human rights, despite having done nothing at all against their oppressors. Whatever Hitler's place in history might have been as a power mad conqueror, his responsibility for leading a nation into the most barbaric acts of modern times should never be forgotten.

Although it is not the function of this book to go into detail about the Nazi war crimes, it is nevertheless impossible to research this era of our history without being disgusted and dismayed that people could perform such unspeakable acts on other people. The sad fact is, there are parts of the world where such atrocities are still being perpetrated on innocent victims—perhaps not on such a large scale, but that doesn't make it any less revolting. It is important that we not forget or think it can't happen again!

Chapter 17
1942

THE EIGHTH AIR FORCE

While the British had begun night bombing missions over Germany, they still lacked the power and resources to take on Germany alone. Thus it was the answer to Churchill's prayers when the Americans began to seek sights for their bomber bases in England shortly after being drawn into the war.

On February 20, 1942, seven American officers, dressed in plain clothes, arrived in England to begin the process of creating the biggest bombardment campaign in history. At the head of the group was Brigadier General Ira C. Eaker who was to remain a major figure in the American strategic bombing campaign throughout the war (though General Spaatz would succeed him as commander in 1944). With him were Lt. Col. Frank A Armstrong Jr., Major Peter Beasley, Captain Fred Castle, Captain Bernie Lay Jr., Lt. Harris Hull, and Lt. William Coward Jr. Late in the war, Fred Castle, as General Castle, would distinguish himself as a pilot and give his life in a heroic effort to save his bomber's crew and preserve lives on the ground. He was awarded the Medal of Honor for this action. These seven officers were to find the sites for the American bombers and fighters and to set up the Yankee invasions. First they had to invade England (in a benign way, of course), then they had to bomb Germany into submission. That was their task.

The plan called for the installation of 60 combat groups composed of 17 heavy, 10

The Nations United

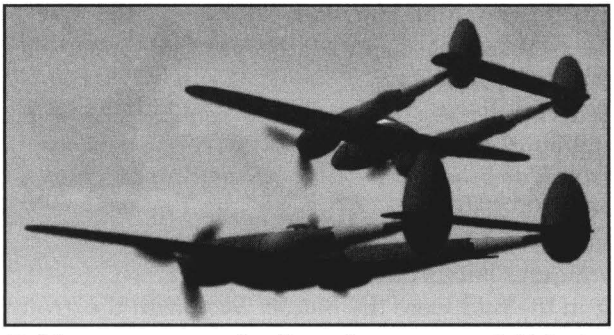
On January 1, 1942 a momentous pact was made between 26 nations allied against the Axis powers. These nations, calling themselves the "United Nations," vowed to oppose the enemy, and not to make a separate peace. Their commitment was "to ensure life, liberty, independence and religious freedom, and to preserve the rights of man and justice."

On the next day the arms commitment of the American forces for the next two years was increased from 12,750 aircraft to 45,000. A similar increase in tanks and machine guns produced by the US was planned.

medium, and 6 light bomber groups with 7 observation, 12 fighter, and 8 transport groups. This combined force of 3,500 aircraft would need to be placed in the United Kingdom by April of 1943. Among the challenges were the availability of airfields, supply and repair depots, training for crews, and, of course, the supply needs of the men and aircraft.

Just getting the operation aircraft to their English bases proved to be a learning experience. The first B-17Es and P-38s to attempt the crossing from the U.S. to England via Greenland met with severe weather problems, and three Fortresses ran out of fuel and had to perform emergency landings. The first manned combat aircraft of the USAAF arrived on July 1—a single B-17 with four P-38s. By July 27, 180 aircraft of the 1st, 60th, and 97th Groups had been brought over with the loss of five B-17s and 6 P-38s. Several of those planes lost were thought to have been misled by phony direction broadcasts issued by the Germans.

A B-17E in camouflage paint.



P-38s were among the first planes to reach Britain.

Meanwhile, some American fighter squadrons were training in Spitfires with the American insignia painted on them. It was in one of these aircraft that Lt. Samuel S. Junkin got credit for the first official USAAF kill of the war on August 19, an FW 190 over Dieppe. Junkin and seven other Spitfires of the 31st Group were shot down in the battle, though Junkin survived the icy waters of the Channel.

DAY VS. NIGHT

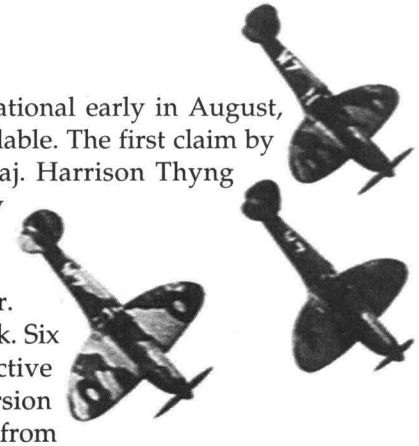
Both the British and the Germans had abandoned daylight bombing efforts by the time the Americans entered the war, though both continued night bombing raids. As the war progressed, the British became more and more adept at night bombing, which was enhanced considerably by the development of specialized electronic guidance systems.

Meanwhile, the American bombing proponents, led by General 'Hap' Arnold, continued to believe in daylight bombing, and despite serious disagreement from the British, the Americans proceeded with their plans. Among their arguments in favor of the daylight approach were that the new American bombers could fly higher and faster than previous models, and that they had better defenses. At the high altitudes, the bombers should be immune to anti-aircraft (AA) fire and would be protected from many fighters whose performance would drop off at high altitudes, if they could reach them at all. The accuracy of these assumptions were unproven, and in time

would be proven, if not completely false, at least less than perfectly true. However, the might of American industry was eventually able to overcome any kind of miscalculation on the part of the daylight bombing proponents. At this point, the advocates of strategic bombing were just looking forward to the opportunity to prove their point.

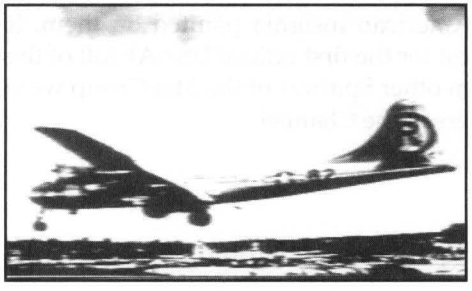
The secret weapon of the Americans was the Norden Bombsight whose accuracy was reputed to be able to drop a bomb in a pickle barrel from four miles up. In the course of real war time conditions, the Norden sight proved to be less accurate, but still provided a significant advantage for the high flying bomber groups.

THE FIRST HEAVIES GO TO TOWN



The newest American fighter squadrons had become operational early in August, mostly flying in Spitfires, though some P-38s were also available. The first claim by an American fighter pilot occurring on August 8th by Maj. Harrison Thyng when he damaged an FW 190. However the first heavy bomber mission of the Eighth Air Force, scheduled for August 10, 1942, had to be delayed due to weather—a consistent enemy of the bomber missions throughout the war.

Finally, on the 17th, the mission took off from Polebrook. Six B-17s rendezvoused with an escort of Spitfires at a distinctive geographical landmark called The Naze. This was a diversion force, while the real bomber group took off 15 minutes later from Grafton Underwood. Among the planes flying in the raid were the *Butcher Shop* with the group commander, Col. Frank Armstrong in the co-pilot's seat and, as pilot, Major Paul W. Tibbets who was three years later to fly the *Enola Gay* over Hiroshima. In another plane, the *Yankee Doodle*, was the Commanding General of the VIII Bomber Command, Ira Eaker.



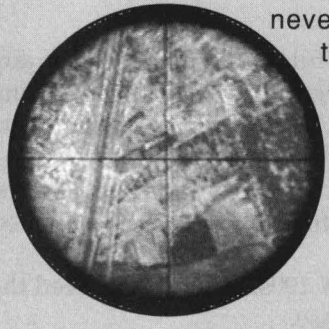
The* Enola Gay, *the B-29 in Major Tibbets' future.

The main mission was to attack rail yards at Rouen, and as they crossed the Channel, the German monitoring station thought they were seeing a force of British Lancasters. Flying at 23,000 feet, they dropped 36,900 pounds of bombs, approximately 50 percent of which hit targets. Despite a few AA hits and one pigeon which shattered the plexiglass nose of one plane, all 12 of the bombers returned to base safely. Eaker was photographed as he emerged from the *Yankee Doodle*, and much press coverage was addressed, not to the B-17 in question, but to the *Yankee Doodle* . This prompted Air Marshal "Bomber" Harris to send a note to Eaker which read, "*Yankee Doodle* certainly went to town and can stick another well-deserved feather in his cap."

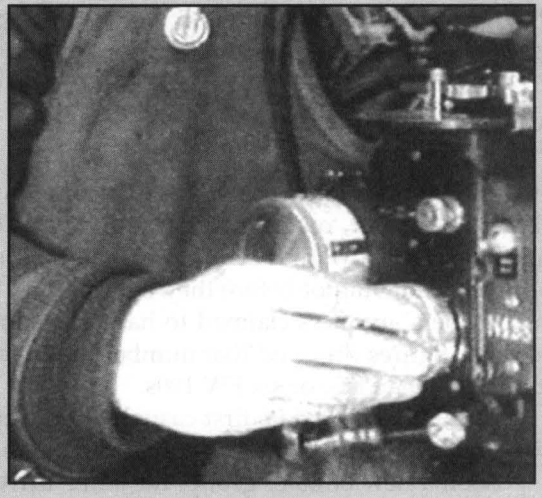
The Norden Bombsight

The Norden Bombsight was one of the secret weapons on the American side. Originally developed by the Navy for ocean-going bombers, the accuracy of this bomb-sight became the corner-stone of the American daylight bombing campaign; without it, perhaps the American commanders would have thought twice about mounting risky missions over enemy territory in broad daylight. But with the 'pickle-barrel accuracy' of the Norden sight in their arsenal, daylight bombing was worth the risk. The Norden Bombsight allowed the American bombers to pinpoint strategic targets and hit them accurately.

Anyway, this was the way it was supposed to go. Certainly, when the weather cooperated, the Norden sight was remarkably accurate. However, in cloudy weather, it was virtually useless and radar-guided bombing missions were necessary. However, the American bombers were never able to achieve the same degree of accuracy with radar-guided bombing as they did using the Norden sight.



View through the Norden.



Such was the indoctrination given to the bombardier that he valued the Norden bombsight very highly. On July 7, 1944 when Lt. Marion Havelaar was told to jettison anything unessential from a damaged B-17, he first threw over any loose equipment he could find. But when the navigator told him to chuck the 20 lb. bomb sight, he said no. "Later he went back to the pilots returning to point at the bombsight again. I gently pulled the pin, picked it up and carried it over to the hatch. We dropped it out carefully trying not to damage it in the process!" (from **The Mighty 8th**.)

How Did the Norden Bombsight Work?

The Norden Bombsight performed a lot of the bombardier's work for him. However, a skilled and experienced bombardier was needed to calibrate and set up the sight. When properly used, the Norden sight would automatically guide the bomber to the right position and release the bombs at the proper moment.

The Norden sight consisted of several key components. The main mirror, not much bigger than a watch face, would be the bombardier's window on the ground target. Meanwhile, a variable speed motor drive simultaneously synchronized the mirror's movement with the airplane's speed. The mirror, once adjusted, would keep the target fixed in view. To the bombardier, the target would be as steady as the Rock of Gibraltar, despite the fact that the airplane was moving at several hundred miles per hour.

Of course airplanes pitch, roll and yaw. Generally, they bump around a lot, especially when there is wind, or flak, or propeller wash from other planes. So the Norden sight had two gyros—one vertical and the other horizontal—to keep the image in the mirror completely steady.

Finally, once all the settings were made, the Norden Bombsight became pilot. Set in Autopilot, the Norden would steer the plane to the correct position and release the bombs at just the right moment. Even crosswinds were no problem for the Norden, which would calculate the trajectory of the bombs accurately as long as a line of sight could be maintained.

GAINING EXPERIENCE

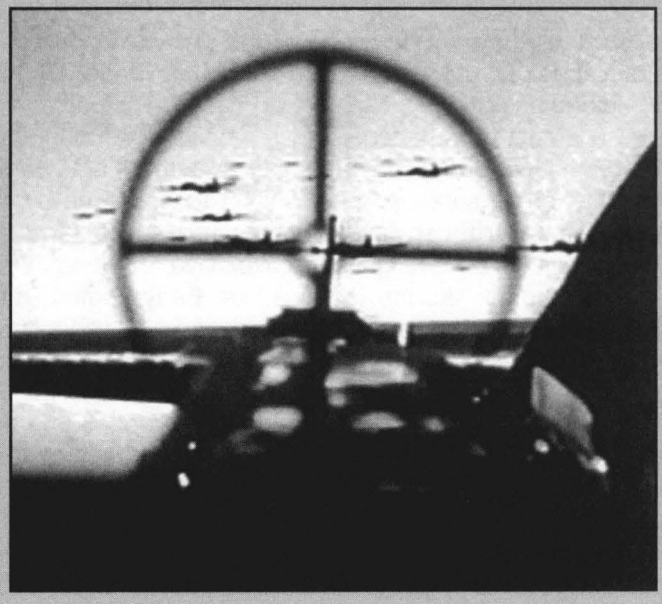
Two more small raids flown after the one on Rouen were successful, without the loss of any planes. However, on August 21, a delay in formation of the Fortresses caused the escorting Spitfires to run low on fuel and break off their escort halfway across the North Sea. The bombers were recalled, but not before they had run into trouble with some FW 190s. In the ensuing melee, the bombers' gunners claimed to have shot down as many as seven of the twenty-five fighters, but later figures dropped that number down to two, and the total attacking force was estimated at no more than five or six FW 190s.

The 97th suffered its first casualty in the encounter with the FW 190s, but it also proved the worthiness of the B-17 under attack as all of the planes returned to base.

Soon a new bomber group, the 92nd, arrived equipped with the new B-17F bombers which had more than 400 design changes from the earlier B-17E. Another group, the 301st, flew in a combined mission on September 5 with the more experienced 97th in a return attack on Rouen. Errant bombs from the inexperienced 301st were thought to have fallen on civilian French areas, killing 140. This was one circumstance that the Americans had hoped to avoid and that the Germans wasted no time capitalizing on. The next day, more misfortune hit the Americans as they lost their first two bombers in combat when attacked by the elite "yellow-nosed" FW 190s of the Luftwaffe Gruppe II/J.G. 26.

The Mighty Eighth continued to fly missions throughout September, and on October 9th, they flew the biggest mission so far—108 heavies (B17s and B24s) against the Fives-Lille

The Fifty-Caliber Machine Gun



It wasn't exactly a secret weapon, but the American-built Browning M2 50-caliber machine gun was one of the most effective weapons available to our aircraft. With much greater power and destructive potential than its predecessor, the 30-caliber, the 50 was able to destroy enemy planes, armored vehicles, and even, according to one article, Japanese destroyers! It was used extensively by the Americans in fighters and bombers, and was also employed by the Russians in American-built planes, and eventually by the British.

The 50-cal. had range. According to one source, it could shoot down a Japanese Zero before the enemy could reach firing distance, and it could counter the German cannons' 1,000 yard reach, preventing the Luftwaffe from sitting out of range and lobbing in cannon shells with impunity.

The 30-caliber gun was still a useful weapon for ground fighting. It didn't take more than that to kill a man, and its rate of fire was 300 rounds-per-minute faster. But to destroy machines, the 50 was the weapon of choice.

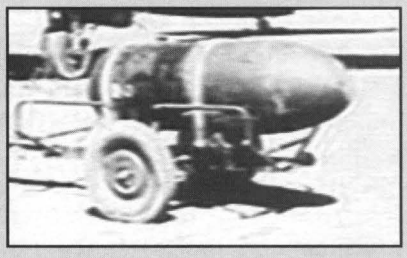
Weight	64 pounds*
Max. Firing Rate	800-900 rounds per minute
Muzzle Velocity	2,810 feet per second
Max. Range	7,200 yards (on the ground)†
	(500-1,000 yards in the air)^
Weight of Slug	more than 1/4 pound

*The 50-caliber gun weighs about three times as much as the 30-caliber which weighs in at about 21 1/4 pounds. Some configurations of the 50-caliber weighed more. For instance, a water-cooled anti-aircraft version weighed more than 120 pounds.

† That's about 4 miles. The 30-cal. has less than half the range.

^ The loss of range is due to the mechanisms for minimizing recoil in the air.

How Do Bombs Work?



A bomb is basically an explosive device dropped from above. There have been many kinds of bombs developed over the years, but most of them share certain structural basics.

Most bombs consist of a casing which contains the explosive charge, a fin or tail of some kind to add stability, an air screw or vane which rotates as the bomb drops and arms the detonator, and some kind of detonation scheme to ignite the explosive. In the early days, the tail fin was simply a rag tied onto the bomb, like the tail of a kite. Early bombs were pineapple-shaped, but eventually, bombs took on a more elongated appearance with a blunt nose.

Many bombs relied on their ability to penetrate a target before exploding. Penetration was partly a matter of air speed, so the faster a bomb could drop, the more effective it would be at penetrating the target. Some bombs, designed primarily for deeper penetration, were fitted with armor-piercing casings, but they often sacrificed some power since they couldn't carry as much explosive.

In principle, bombs were safe until armed. A wire held the air screw or vane, preventing it from rotating and arming the detonator. Theoretically, dropping a bomb with the arming wire still in place would be safe. This was not recommended, however. So arming a bomb meant removing the wire.

During World War II, a 100-lb. bomb could penetrate about one foot of reinforced concrete or about 2.5 inches of steel. According to one source it could cause damage from pieces in a 200-foot diameter and cause a crater approximately 20 feet around and six feet deep, though this may be exaggerated. In comparison, a 2,000-lb. bomb would penetrate 3 feet of reinforced concrete, 15 inches of steel (depending on the type of steel), and cause damage in a 1,000 foot diameter. It would create a crater 50 feet across and 36 feet deep.

steelworks in Belgium. The result of the mission was the loss of four bombers, inconclusive bombing results, and very high claims for German fighter losses by the American gunners. These claims of at least 56 fighters shot down were clearly inaccurate. Revised claims of 21 are even disputable as German records only indicate two losses. In retrospect this was perhaps not a particularly successful mission, but it was received with optimism at the time, and that might have been more important than the bare facts themselves. In the light of future events, optimism was a valuable commodity for this fledgling endeavor.

ELSEWHERE

After the winter of 1941, Hitler had tried to patch his armies back together. In the unsuccessful bid to take Moscow and conquer Russia, Germany had lost an estimated 1.6 million troops. Of 16

tank divisions, only the equivalent of one division could be made operational. It was time to get new men and build new war machines.

Hitler's rearmament plans were somewhat shaken by the death, on Feb. 8, of Fritz Todt, Germany's Minister for Armaments and War Production. However, Albert Speer was Todt's successor and was equally ruthless about employing the slave labor of the French, Dutch, Danish, Belgian, Polish, and other prisoners of the Reich. Although Todt had been the principal architect of the infamous Todt Organization, Speer proved to be a worthy successor.

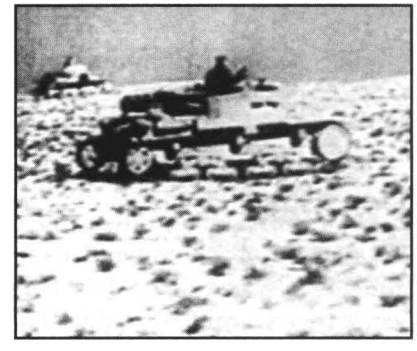
Hitler's plans for the summer of 1942 included a modified attack on Russia, aimed primarily at obtaining control of crucial oil fields. Oil was one of the most critical commodities for the German war effort, and was one of the factors that eventually led to its undoing.

In May and June 1942, Hitler's North African campaign brightened as General Rommel, the Desert Fox, moved swiftly across the map to capture Tobruk and pushed onward to El Alamein, only 65 miles from Alexandria and the Nile delta. The key was control of Egypt and the all-important Nile River Delta. Rommel was gaining ground, but Hitler once again miscalculated and sent feeble reinforcements. Moreover, the British had Ultra and still controlled the strategically vital island of Malta, from which they were able to pick off the supplies coming to Rommel's aid, preventing the majority from ever reaching him.

Rommel at Tobruk.

The Germans focused attention to Malta then, bombing it and nearly driving the British out, but Hitler had postponed a serious effort to take over the island, and reinforcements, including Spitfires ferried on the U.S. carrier *Wasp*, arrived in time to cut off Rommel again. Without the vital supplies, Rommel's chance to gain control of the Nile and the Suez slipped away.

In the Atlantic, the Germans were still enjoying great successes, sinking about 700,000 tons of Allied ships each month. And despite the lost opportunity on the Nile, the Germans controlled most of the Mediterranean. The troops in Russia had advanced into the Maikop oil fields, which had largely been destroyed by the retreating Soviets, and were threatening the vital oil facilities at Grozny. Meanwhile, having passed up a perfect opportunity to attack Stalingrad, Hitler changed his mind again and his troops headed for the city.



An Afrika Corps tank.

Despite the objections of his generals, Hitler insisted on taking the oil fields in the Caucasus and Stalingrad simultaneously. With severely thinned out troops, equipment shortages, and the

dubious support of foreign troops from Italy, Rumania, Hungary covering the northern flank of the advance to Stalingrad, and other countries, the Germans were in a dangerous position. When his General Staff Chief pointed out the dangers of the situation, Hitler canned him.

Stalingrad became a meat grinder for the Nazi troops, and Hitler sent more and more of them into it. The Russians resisted with great will, and the torn-up city provided a perfect place for them to hold off and slaughter the invaders.

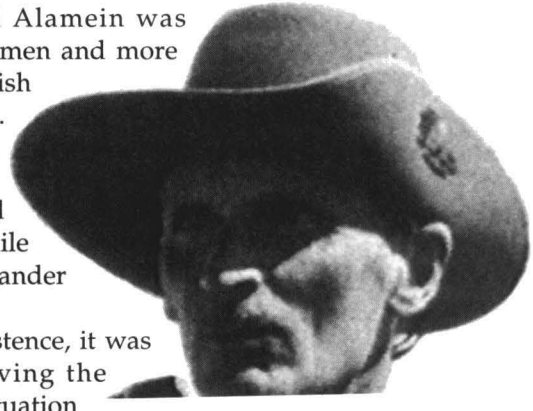
Fighting in the rubble-strewn streets of Stalingrad.

Stalingrad was a meat grinder.

And even Rommel's victories were turning to defeat.

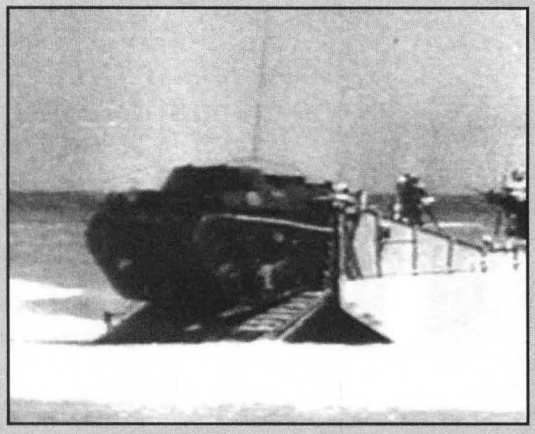
By October, Rommel's attempt to take El Alamein was similarly doomed. With reinforcements including men and more guns as well as American tanks and planes, the British were ready to take the battle to Rommel's forces. Meanwhile, Rommel was ill and had temporarily left the front. At about the same time, an eccentric and talented new commander, General Sir Bernard Montgomery, had taken over the Eighth Army while General Sir Harold Alexander had become Commander in Chief in the North African theater.

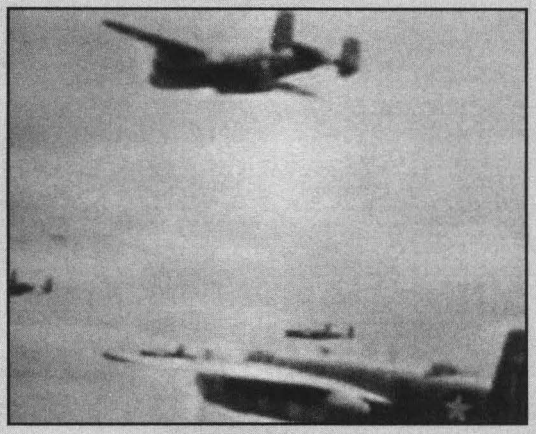
By the time Rommel returned, at Hitler's insistence, it was too late. The British had struck and were driving the Germans back. As usual, when apprised of the situation



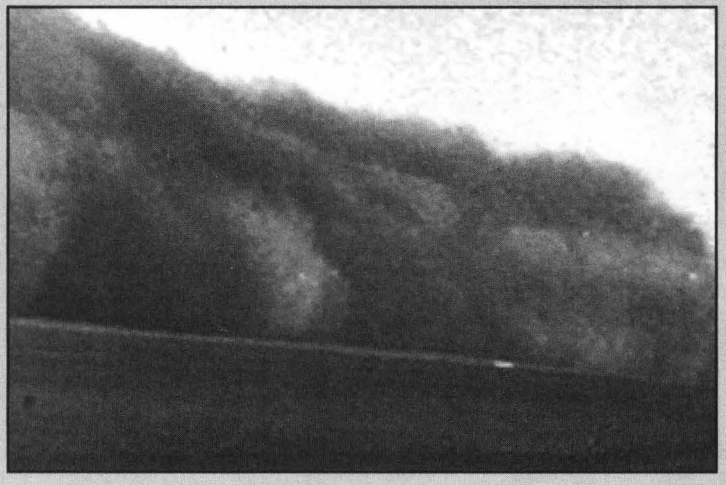
Monty.

Operation TORCH and El Alamein





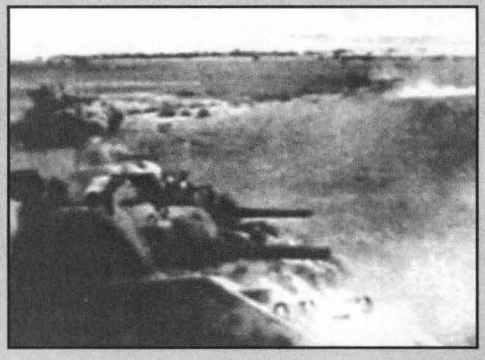
Tanks and troops landed on the North African beaches. The soldiers would fight the sand and parching heat as well as Rommel's Afrika Corps. Elsewhere, B-25 bombers were used to soften up the enemy.



A North African sand storm.

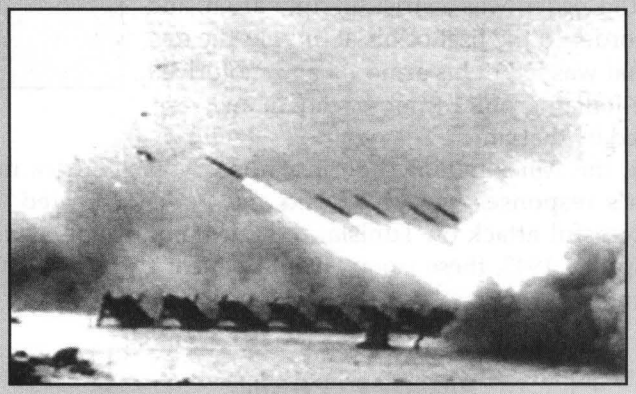
Memories of better times and places.

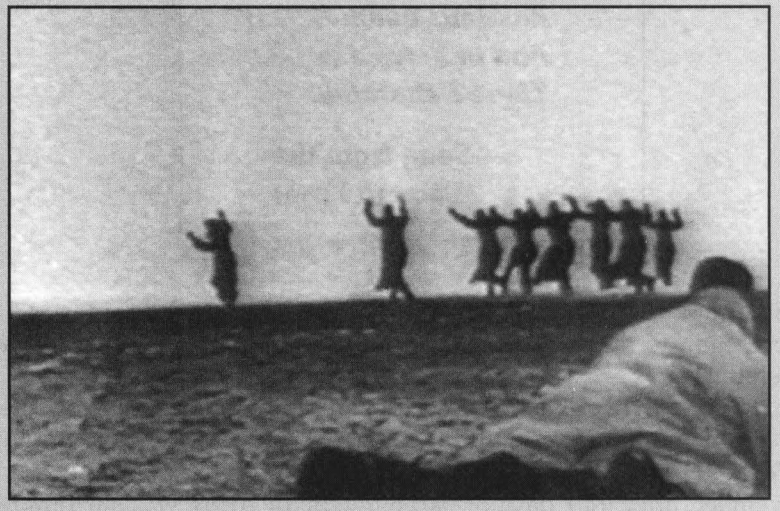
The pivotal battle for North Africa took place at El Alamein where Montgomery was finally able to break the back of the Afrika Corps and begin to drive them out. The Qattara Depression was critical. It was an area where tanks could not maneuver, and formed an extra defensive line for the Allies.

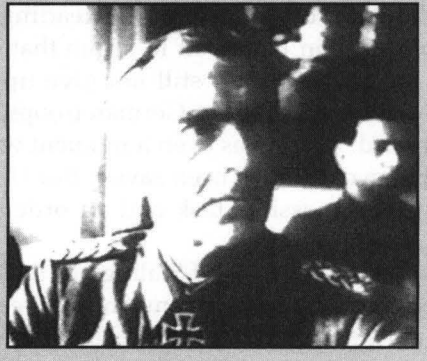


Minesweeping could be a hazardous duty, to say the least, and the method left something to be desired. Using sticks, men would walk abreast, digging in the sand and looking for the edges of mines. To make matters worse, they would often be doing this directly in the path of an artillery barrage.

The Fall of Stalingrad







With the final assault on Stalingrad, Hitler's hope to keep the city was lost. Expecting the German soldiers to fight to the last, he was bitterly disappointed when they surrendered by the thousands, and when his general, von Paulus, also surrendered.

Military Terminology
82nd Division
XIX Corps
First Army

Hitler sent a message to Rommel exhorting him to stand fast—a decision that would with absolute certainly result in the decimation of all of Rommel's troops. Rommel, despite knowing the error of this order, was a strict disciplinarian, and he finally obeyed the order to the best of his ability. In the end he did retreat with what was left of his armored and motorized units, abandoning the Italian ground troops, who, in any case, had mostly surrendered by that time.

Shortly after that, the Allies mounted an invasion of North Africa in a move designed to flank Rommel. Hitler's responses were confused and poorly directed. He poured men and equipment into a successful attack on Tunisia, though this did not save Rommel or stop the Allied invasion. (By spring, 1943, these troops would be lost and some 250,000 prisoners taken, half of them German troops.)

Russians in front,
Russians behind,
And in between
There's shooting.

—Song from the Eastern Front

And while he took the train to Munich to join in an annual beer festival with old party cronies, disaster began to take shape both in North Africa and in Russia where the Soviets readied a counterattack.

Once again, faced with overwhelming odds against a weakened position, the Führer refused to allow his troops in Stalingrad to withdraw and reform. "I won't leave the Volga. I won't go back from the Volga."

In late November, after four days of battle, the Sixth Army was surrounded. Even so, the Germans could have pulled out as Field Marshal von Manstein was leading a rescue force against the Russians, moving northeast. Von Manstein had tried to argue that the Sixth Army should attack and move toward his forces, but Hitler would still not give up Stalingrad. So, despite the brutal winter weather, which once again engulfed the German troops, and despite his misgivings, von Manstein's armies moved forward. There was even a moment when, if the Sixth had attacked and moved out of Stalingrad, they would have been saved. But Hitler would only let them advance if they also held the city—an impossible task and an order that drove the generals on the field to distraction.

With General Hoth's 4th Panzer Division within 30 miles of Stalingrad, they could advance no further. Still, Paulus' Sixth was not allowed to push toward them, and the result was the loss of more than 200,000 troops and Stalingrad as well. New orders recalled some of Hoth's tank

divisions to counter a new attack by the Red Army further north. The opportunity was gone. Now it was only a matter of time. And even when the situation had become completely hopeless, Hitler would not let Paulus surrender, despite generous terms from the Russians.

Hitler often blamed his generals for his own failures.

In the end, Hitler and his propaganda machine attempted to glorify the Sixth Army's long and patriotic fight to hold Stalingrad, but the truth is both sadder and more sinister. By now, Hitler's obstinate and overly romantic image of his war demanded such sacrifices as "fighting to the last" man. He fully expected Paulus to die in defense of Stalingrad, and his soldiers to form a "hedgehog" defense, finally killing each other with their last bullets.

Hitler's failure to listen to his advisors and his consequent mistakes point to the fact that, often, when faced with tactical or strategic dilemmas, he would avoid taking appropriate action, preferring to believe that the 'worst' would not happen. Unfortunately for Hitler, and fortunately for the rest of us, the worst often did happen.

Besides his consistently strange inability to come to grips with the facts of the situation and his willingness to sacrifice any number of lives to his 'cause,' another good example of Hitler's emotional philosophy of decision making was exemplified when he fired his long-time Chief of the Army General Staff, General Halder, telling him, "We need National Socialist ardor now, not professional ability."

Meanwhile, by December, 1942, the Nazis had murdered almost 3 million Polish Jews, just about completing their "deportation" of the Polish Jews.

In point of fact, although the war was to last a good deal longer, the two defeats Hitler had suffered in Russia and in North Africa were clear indications of the future. It was the beginning of the end of the "thousand year Reich."

Chapter 18
1943

THE STRATEGIC BOMBING GETS INTO GEAR

From November 1942 to the next May, four B-17 groups carried out daylight raids on German-held territories. At this time, the total U.S. bomber force amounted to about 140 B-17s and some B-24s, but the effective forces were probably less than two-thirds that number. The days of the thousand-bomber raids were still ahead.

Head-on Attacks

The experienced German fighter pilot Oberstleutnant Egon Mayer had already met the Flying Fortresses previously, and he knew of the firepower their rear and side .50 caliber guns could deliver. But the front of the B-17 was not as well protected, and Mayer successfully tested that theory on November 23, 1942, shooting down two heavies and severely damaging two more.

This was Europe toward the end of 1942.

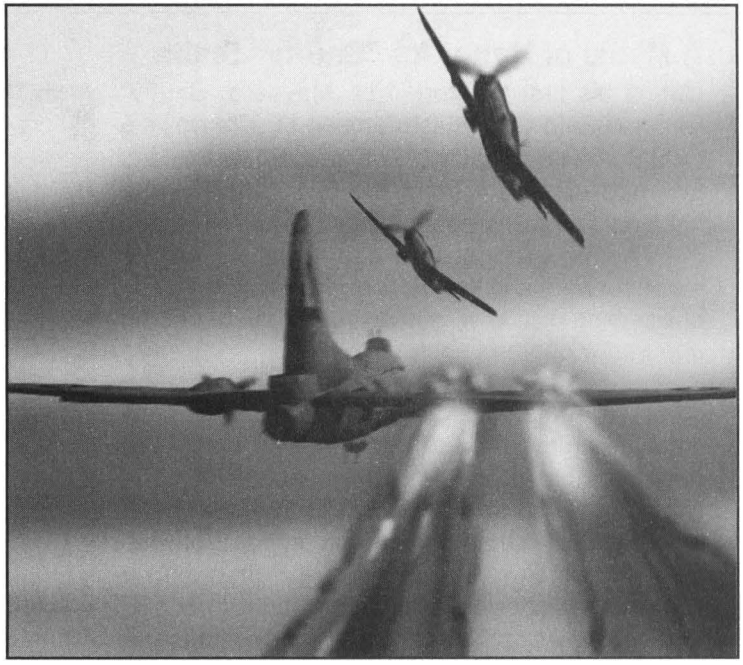
Meanwhile, the Americans realized that the front of the B-17 was its weakest point, so they began to jury-rig new gun emplacements while the design process addressed the problem back at the factory. Eventually some of the Fortresses were equipped with heavy .50 caliber guns designed to fire in unison from the nose. These planes would lead the formations to fend off any frontal assaults. However, it was eventually found that a single .50 caliber gun with a good field of vision was better, and new designs were implemented based on the work of an armorer and a welder, S/Sgts. James C. Green and Ben F. Marcilonis.

The head-on attack had only one major drawback from the German point of view. The closing speed, amounting to the combined speed of both bomber and fighter, meant that only split seconds would be available for taking a shot, and a miscalculation could send the fighter careening into the heavy, which is what happened on many occasions.

The vulnerability of the B-17 to frontal attack was only one of the issues that had to be addressed. There was much experimentation to find the right formation and bombing strategy. At the insistence of Colonel Curtis LeMay, "Iron Ass" to his men, the staggered 'box' formation became the preferred method of formation, but there were potential problems with delivering the bombs, so a system was installed by which the bombardier in the lead plane would signal the drop for the whole formation. This technique was first tried in December of 1942 and remained more or less the *modus operandi* of the bomber formations until the end of the war.

From the bomber's point of view, the best way to avoid the head-on attack was to jink the bomber to throw off the precarious aim of the on-coming fighter, but the difficulties of keeping formation, especially once the box formation was established, prevented this technique from being used often. Once out of formation, the bomber became much more vulnerable.

Of course the Luftwaffe was busily seeking new ways to attack the bombers. One of their strategies was to form fighters to attack from the top and the sides simultaneously, thereby confusing gunners and scattering defensive fire. This technique proved to be effective in early trials. They also tried using twin-engined bombers to drop fragmentation bombs over the formations, but



that experiment was not so successful. Yet another method tried was to shoot parachute mines into the paths of the bombers using the AA guns. On one mission, the Germans even sent out a fake recall order over the radio, successfully causing a flight of bombers to turn back.

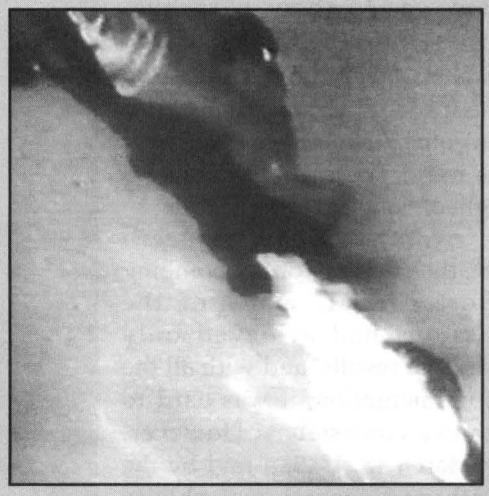
Another area of concern was the accuracy of the bombing effort. So far, many of the missions had achieved only marginal results, and with all the experimentation, it was hard to achieve consistency. However, by March 18, 1943, a raid by the 305th on Vegesack was able to place more than 75% of the bombs within a 1,000 foot circle around the target—the most precise results yet obtained. Soon after, a mission involving 73 B-17s and 24 B-24s dropped 268 tons of bombs on the Bremer Vulkan Schiffbau, a major submarine yard at Vegesack. Again, the results were impressive, and, according to some, this mission may well have turned the tide in favor of continuing the daylight bombing offensive advocated by Generals Eaker and Arnold. Other experts say that nothing, short of outright defeat, would have dissuaded the Americans from the strategic bombing effort.

This mission was not without its sacrifice and heroism. Flying through accurate and intense flak, the lead bombardier in The Duchess, 1/Lt. Jack Mathis was concentrating on the view through the Norden sight when a shell burst near the right side of the plexiglass nose, shattering part of it and blasting Mathis nine feet backward. Mortally wounded, with a severed right arm and deep wounds in his side and abdomen, he was able to reach the bomb controls in order to release the bombs, thereby signalling the rest of the formation to drop its load. He died while trying to reach the controls to close the bomb bay doors. The Duchess was able to return to base safely along with all but one of the mission's bombers, and was eventually to complete 59 missions before retirement.

The Vegesack mission was also notable because it was the first one to implement the new automatic flight control equipment (AFCE), which allowed the bombardier to control the airplane while looking through the bombsight.

Another innovation came when it was discovered that about 70% of the wounds suffered by the bomber crew were caused by low-velocity missiles. The Eighth Air Force approached the Wilkinson Sword Company in London, armorers for more than 300 years, to design some protection for their crews, and the result was the famous "flak jacket," which

A Medal of Honor for "Snuffy" Smith



During his first mission, 1/Lt. Maynard "Snuffy" Smith was to distinguish himself in a harrowing ordeal aboard a flaming Fortress. Several direct hits had started fires in the B-17's tail wheel housing and radio control room. Smith emerged from his now inoperative ball turret to find the waist gunners and the radio operator, all veterans of bombing missions, getting set to bail out of the apparently doomed aircraft.

Smith had no way of knowing the condition of the pilot, or whether the cockpit crew were also preparing to ditch, but he may have reasoned that, since the plane was still flying in formation, it was still under control. With a sweater wrapped around his face as protection from the billowing smoke, Smith fought the fires with a hand extinguisher. Upon checking in the rear of the plane, he discovered that the tail gunner was severely wounded. After helping the gunner, he returned his attention to the fires.

"Focke-Wulfs were now attacking the formation and he occasionally fired the waist guns between fire-fighting and keeping an eye on the wounded gunner. Escaping oxygen fanned the flames to intense heat. Ammunition boxes stored near the radio began to explode and Smith heaved these through the gaping hole burnt in the fuselage side, or moved them away from the flames. For 90 minutes he fought the flames with clothing and, as a final gesture, urinated on the smouldering wreckage. Nearing the English coast, Smith threw out all items of equipment he could in order to lessen the strain on the rear of the fuselage. Fire had so weakened the structure there was real danger that it might break up on landing. Fortunately the fuselage held when Johnson landed it safely at Predannack, near Land's End.

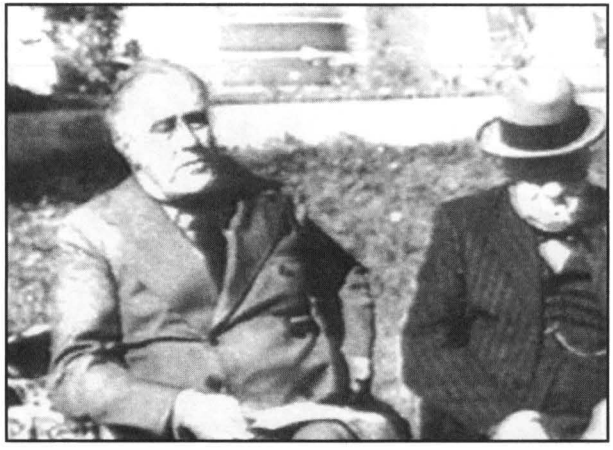
The fire had been so intense that some metal parts of the camera, radio and gun mounts had melted. The aircraft also had a damaged propeller and engine nacelle, its oxygen and inter-communication systems were wrecked, the top turret, nose, flaps and wing fuel tank had been hit and damaged, and the tail wheel well had been burnt out.

A few weeks later, the slight, 32-year old ball turret gunner received his country's highest decoration for this action." 'Snuffy' Smith's Medal of Honor was the first awarded to a living member of the Eighth Air Force. (from **The Mighty Eighth**.)

contained overlapping two-inch square plates of laminated manganese steel in a sort of vest that could be easily removed. These early models weighed in at around 20 pounds each and were not very flexible. But they were effective. Later improvements resulted in more flexible, lighter weight jackets.

Many myths and superstitions surrounded the bomber crews. In one instance, a navigator had a premonition that he wouldn't return, so he brought along his shaving kit. His bomber was shot down and ten parachutes were seen escaping it, so it seems his premonition was correct. (The B-17 carried a crew of ten, so the navigator presumably got to use his shaving kit.)

THE CASABLANCA DIRECTIVE



Roosevelt and Churchill at the Casablanca Conference, and the hotel where it was held.

Admiral King and General Marshall at the Casablanca Conference.

In January, a plan for strategic bombing was worked out in Casablanca. This so-called Casablanca Directive was the main blueprint for a combined bomber offensive whose goal was to weaken the German resolve and destroy its military to the point where resistance was pointless. However, there was still sharp disagreement between the American and the British operational commanders. Eaker favored attacks on the bottleneck industries with priority given to the submarine yards, the aircraft industry, ball-bearing factories, oil plants, and others such as transportation and synthetic rubber factories. Another secondary objective was to weaken the Luftwaffe's fighter strength.

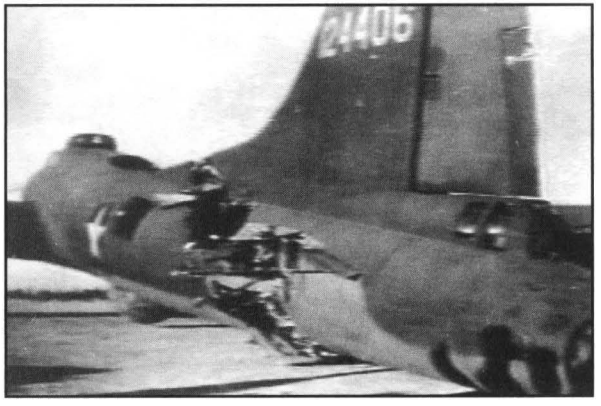
Harris, for the British side, advocated area bombing of major cities and built-up areas to sap the will from the German people. The result was that each side continued on its path. The Americans continued to pursue daylight bombing of strategic targets (which Harris dubbed 'panacea targets'), while the British continued night attacks primarily on urban centers.

THE TOUR

By early February of 1943 it was possible to assess the situation a little. There was good news and bad news. The good news was that not a single bomber mission had been turned back by enemy fire. In fact weather had been a more severe opponent in some ways. Now the bad news. It seemed that the odds were against the survival of any individual in the bomber crew. Bombers were being lost at an average of one for each 20 sorties. The combat tour was 25 missions. The odds were not good, and in fact only about 25% of the crew survived in those early days. It wasn't until May or June that the veteran crews were able to retire because losses had been about three times higher than replacements.

What's in a Name?

Many bombers sported imaginative names, and their crews became a tight-knit group. Among the more renowned of the bombers were *Memphis Belle* (subject of the documentary film by William Wyler), *Invasion II*, *Delta Rebel II*, *Bad Penny*, *The Careful Virgin*, *The Eagle's Wrath*, *Jack the Ripper*, *Our Gang*, *Quitcherbitchin*, *Hell's Angels*, *The Duchess*, *Eight Ball*, *Jersey Bounce*, *Satan's Workshop*, *Yardbird*, *Thumper*, *Wham Bam*, *Dry Martini 4th* (flown by Captain Allen Martini and his 'Cocktail Kids'), *Carter's Little Liver Pills* (flown by Captain J. W. Carter and his 'little liver pills'), *Sunrise Serenader*, *Boom Town*, *Lucky Strike*, *Southern Comfort*, *Wahoo II*, *Nemesis*, *Joan of Arc*, *Geezil II*, *Picadilly Commando* (a popular bomber epithet), *Impatient Virgin*, *Sweetpea*, *Chennault's Pappy*, and *Little Audrey*. Most of these bombers flew close to twenty or more missions. Some flew more than a hundred.



Unlike the fighter pilots who held their fate in their own hands, bomber crewmen were often not much more than moving targets. They could shoot back, of course, but they couldn't easily evade or hide from the enemy who was faster and more maneuverable. The metal skin of the bomber was about all that protected them from the cannon shells and flak bursts. There was nothing they could do but try to shoot down the enemy and hope they didn't get shot. Six to ten months of this could wear out anyone's nerves—if they survived that long.

Meanwhile, events in North Africa and on the Eastern Front continued to favor the Allies. The Red Army was retaking German-held territories while the combined British and American forces were slowly tightening the knot on the important Tunisian peninsula, despite effective resistance by Rommel and von Arnim. The Allies held an advantage unknown to the Germans, however. They were able to intercept all the crucial messages using the Enigma machine and therefore knew in advance about their enemies' condition.

Elsewhere during February, a second attempt to sabotage the Nazi's heavy water plant in Norway succeeded, seriously undermining Germany's attempts at building an atomic bomb.

Members of the small group called the White Rose were captured, sentenced to death, and guillotined for spreading anti-Nazi leaflets and painting slogans like "Down with Hitler" on walls in Munich. Unfortunately, the majority of the German people still supported the fanatical ideals of the Nazis, as is evidenced by their vociferous response to Goebbels' speech on February 18 where he exhorted a crowd to accept total war, the full support of the Führer, and the total elimination of Jews from Europe.

A few days later, von Manstein began another push at the Russian Front, retaking the city of Kharkov. Meanwhile, Rommel was forced to retreat as his British opponents continued to receive supplies and reinforcements while his own supply ships could not get through to him. Of course the British were able to intercept his supply ships thanks to the information provided by Enigma and British Signals Intelligence.

"We are the master race, which must remember that the lowliest German worker is racially and biologically a thousand times more valuable than the population here."

—Erich Koch, Nazi Governor of the Ukraine, March 5, 1943 in a speech at Kiev.

Hitler's part in the fall of Stalingrad and his foolish path of war against two powerful enemies had caused many of his military leaders to doubt him. There is a story that may or may not be true that on March 13th, a parcel bomb was slipped onto a plane carrying the Führer, though the officer carrying it thought he had a package containing two bottles of liquor. Had the bomb exploded as planned, Hitler's story might well have ended there, but a faulty detonator meant the failure of the assassination attempt. True or not, there was increasing resistance, even in Germany, to the Nazi regime and its policies.

"If the English are in a position night after night to attack some German city, one can easily imagine how Germany will look after about three months unless we take effective countermeasures."

—Goebbels' diary, March 11, 1943.

"Forward to Tunis and drive the enemy into the sea."
—Montgomery on April 10th after the occupation of Sfax.

Not all bombing results were to be publicized by the Allies, but rather by their enemies. It wasn't all that uncommon for bombs to go astray and kill civilians. In one such unfortunate incident on April 5, 1943, the American bombers largely missed their target, the Minerva aircraft factory near Antwerp. Errant bombs were responsible for the deaths of almost a thousand civilians, including 209 school children. The Germans arranged a very public funeral for the dead and used the incident, as they were to use many such incidents, for propaganda purposes.

The Death of Yamamoto

The value of code breaking was once again proven when the American Pacific Fleet's Radio Unit successfully decrypted a Japanese transmission that gave the exact information about the travels of Admiral Yamamoto, the Commander in Chief of the Combined Fleet. The Americans successfully intercepted Yamamoto's plane and shot it down, though they did not indicate publicly that the assassination had been purposeful. To do so would have jeopardized the secrecy of their cryptography efforts. Even though they were successful, and Magic was not compromised, it was perhaps too big a risk to take.

Also in April, Robert Serber was to meet in secret with group of scientists to outline the Manhattan Project whose aim was "to produce a practical military weapon in the form of a bomb in which energy is released by a fast neutron chain reaction in one or more of the materials known to show nuclear fission." Ironically, Japanese physicists had come to the conclusion, only a month earlier, that none of the combatants would be able to produce such a device in time to be instrumental in deciding the war.

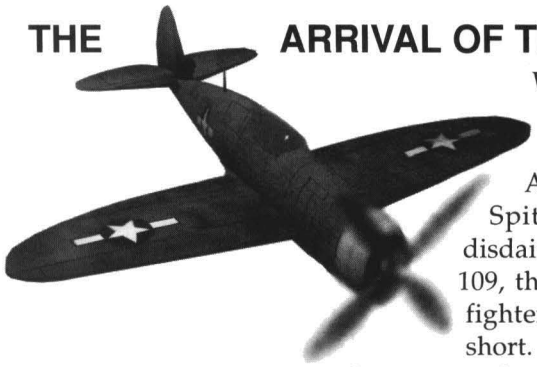
EXPANSION

Even though the previous months of bombing had done little serious damage to the German war machine, the experiment in daylight bombing had been justified in the eyes of the generals and tacticians in charge. Therefore, in April 1943 four more groups of heavy bombers arrived in England with seven more groups scheduled to arrive within the next two months.

Some of the confidence the Americans enjoyed was due to the high attrition rate they had inflicted on the Luftwaffe fighters. Even scaling down the obviously exaggerated claims, they figured to have downed at least 450 fighters. Their confidence might have been shaken somewhat if they had known that the real figure was probably closer to 50.

In May another milestone was reached as a major raid was sent over the Ford and General Motors plants at Antwerp. Accompanying the 79 Fortresses were twelve squadrons of fighters, including six squadrons of the new P-47 Thunderbolts on their first escort mission.

THE ARRIVAL OF THE P-47S



When the P-47 Thunderbolt first arrived in England in December of 1942, it was not to particularly good reviews. The elite 4th Fighter Group, and the famous American Eagle Squadrons, were fiercely loyal to the Spitfire, and they considered the new airplane with disdain. At more than twice the weight of a Spitfire or Bf 109, the Thunderbolt was considered a suicidal plane as a fighter. They nicknamed it the "Juggernaut" or "Jug" for short. Some think the name Jug referred to the shape of the plane as seen from the side.

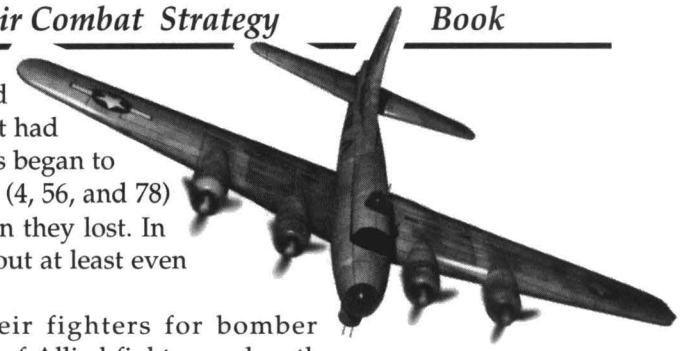
The requirements of wartime meant that the first squadrons to use the P-47s had to do the 'bug' testing, and almost 200 unsatisfactory reports were filed. Eventually most of the problems proved correctable, but in tests against a captured FW 190, the Thunderbolt proved to be inferior below 15,000 feet. In its first operational trials another problem surfaced. Unusual electromagnetic output from the engines caused radio interference, blanking out communications between planes. It was a month before this problem could be resolved and the Thunderbolts made operational again.

Engine problems were persistent during the first months of the P-47s' combat life. More planes were lost to engine failure than to enemy fire, and many pilots still had not warmed to the plane. The experienced fighter pilot, Maj. Donald Blakeslee, was the first to score a kill in the P-47 as he shot down an FW 190 by following it down in a steep dive. But when congratulated, he reportedly commented that the Thunderbolt ought to be able to dive since it certainly couldn't climb.

However, there were encouraging signs. The P-47s performed better at low altitude than expected, particularly in its turning circle and top speed. Also, the Thunderbolt was a rugged plane. It could take a lot of damage and still fly. This was to become its best feature later in the war when compared with the otherwise superior P-51 Mustang whose liquid-cooled engine was more vulnerable. In early P-47s, however, engine problems were still the biggest concern.

On May 8, 1943, Goebbels wrote in his diary, "The Führer expresses his unshakeable conviction that the Reich will one day rule all of Europe. We will have to survive a great many conflicts, but they will doubtless lead to the most glorious triumphs. And from then on, the road to world domination is practically spread out before us. For whoever rules Europe will be able to seize the leadership of the world." Exactly two years later, the Führer's glorious armies would surrender unconditionally amid the ruins of their country and their leader's dreams.

On May 25th, Churchill and Roosevelt gave a joint press conference. Churchill, ever the orator, told the press that the power of the air force "was the weapon these people chose to subjugate the world. This was the weapon with which they struck at Pearl Harbor. This was the weapon with which they boasted—the Germans boasted—they would terrorize all the countries of the world. And it is an example of poetic justice that this should be the weapon in which they should find themselves most out-matched and first out-matched in the ensuing struggle."



By the end of May, the Thunderbolts had come out about even against the FW 190s, but had lost more planes due to engine failure. Things began to look up during June as the three P-47 groups (4, 56, and 78) began to shoot down more of the enemy than they lost. In all, over the first few months, the P-47 came out at least even with its Luftwaffe adversaries.

The Germans preferred to save their fighters for bomber interception and rarely attacked lone groups of Allied fighters unless the advantage was clearly theirs. Thus the green pilots of the newer P-47 groups were able to gain experience while technical improvements were made continuously to the Thunderbolts based on the reports of the pilots who flew them. So, while the P-47s began fairly even with their enemies, they slowly advanced to become a superior weapon.

Perhaps the first test of the P-47 occurred on April 15, 1943 when a composite group of planes from the three operational Thunderbolt groups (4th, 56th, and 78th) encountered FW 190s over Belgium. Maj. Don Blakeslee shot down one, following it from 29,000 feet down to the deck at 500 feet. Other pilots shot down two more of the Focke Wulfs, but two pilots were lost, and one had to bail out over the Channel with engine problems. Still, this was a victory.

May 14, 1943 was a significant day for three reasons. It marked the first time a force of more than 200 heavy bombers were sent on a mission. It also saw the debut of the new B-26 Marauders. And the famous B-17, *Hell's Angels*, completed its 25th mission. *Hell's Angels* had never had to turn back due to mechanical failure and only had one bullet hole and a few patches to repair flak damage. In addition, the P-47s of the 4th and the 78th fought off the Luftwaffe, scoring additional victories. Blakeslee shot down another FW 190 on that mission.

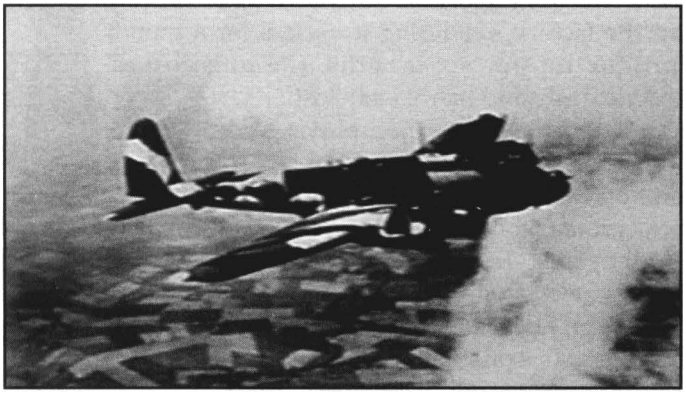
On the 15th, the 78th got one more victory, but lost one pilot. On the 16th, they downed four more FW 190s, losing one. On May 17th, the famous *Memphis Belle* completed its 25th mission, and was the subject of a documentary film, becoming probably the most celebrated B-17 of the war.

However, not all the news was good during May. On several occasions the Luftwaffe was able to execute successful frontal assaults on the bomber formations, waiting until the escorting P-47s were forced to return for lack of fuel. Many Fortresses were lost during the raids of late May. Among the new tactics the Luftwaffe tried were air-to-air rockets which could be shot from outside the defensive range of the heavy bombers. The rockets' accuracy was not

good, but it was only a matter of time before such methods would become effective. And even without great accuracy, the rockets helped break up the bomber groups, leaving the individual bombers more vulnerable.

In several of the successful Luftwaffe attacks, an all gold-painted FW 190 was seen prominently in the battle; however, this strange apparition's pilot was not identified. On May 27th, another tragedy took the lives of 19 men and destroyed four B-17s when a stock of 500-lb. bombs being loaded onto one of the bombers inexplicably detonated.

On May 18th, and again on the 21st, the 4th were able to shoot down four Luftwaffe planes, but lost four of their own each time.



A YB-40.

On May 29th, a new version of the B-17, called the YB-40, was sent on its first mission. This plane had armor and additional gun emplacements designed to make it even more impregnable, but it suffered many problems, not the least of which was its reduced speed caused by the extra weight. Also, the extra guns were effective mostly at the flanks, but most attacks took place at the nose or tail of the plane.

June was even worse. Losses continued to mount as the Luftwaffe poured its strength against the bombers with well-timed attacks. On June 13th, the bombers received such a hot reception that only six of the leading group of sixteen bombers returned. Returning from another mission the same day, bombers of the 94th Group were cleaning their guns only 20 or 30 miles from the English coast when they were attacked by black-painted Ju 88 night fighters. Nine bombers were lost in short order. The total losses for the day were 26 bombers, a new high. Perhaps the only consolation was that the commander of III/J.G.26 was also killed in one of the battles. Bombing results were mediocre, though initial reports had indicated greater success.

The fighter pilots of the 56th Group were starting to achieve some success, and two of the future aces scored on this day. Col. Hubert Zemke shot down two German planes and Lt. Robert S. Johnson, who would finish the war as the second highest scoring ace in air to air combat, scored his first of 27 aerial victories.

However, the Luftwaffe wasn't really interested in engaging the fighters. In more than a thousand sorties from June 1 to June 17, only four victories could be credited to the American fighter pilots.

On June 20, a British shuttle bombing mission flew from England to Algeria, bombing a steel works at Friedrichshafen, then returning to England with a bombing run on the Italian naval base at La Spezia. Unknown to the Allies, at Friedrichshafen they had hit a facility working on V-2 rockets, and the resulting damage caused the location to be abandoned.

THE 24 HOUR BOMBING

It took some time before January's Casablanca Directive was fully enforced. However, on May 14th, the spirit of Casablanca was redefined in Operation Pointblank whose aim was "the progressive destruction and dislocation of the German military and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened."

Perhaps the first successful raid in response to Pointblank was on the synthetic rubber factory at Huls. Though accurate bombing destroyed the factory, rendering it useless for a month and below full production for six months, the unescorted Fortresses were attacked viciously and many were lost.

It had become standard procedure to employ evasive tactics. Bomber groups were vectored at angles to their true destination, following a weaving course designed to prevent enemy ground controllers from being able to predict their target. In addition, diversion raids were mounted to draw fighters away from the main target. In many cases, as on the day of the attack on Huls, the tactics failed to work entirely due to navigational or communications problems.

Assessing the results of the new bombing directive in July, you would have to say it was pretty negligible. Other than the successful attack on Huls, there had been few meaningful raids during the period from May through July. The Luftwaffe had increased its resistance and improved its tactics, and weather had continued to obstruct bombing effectiveness. Although the plans worked out to outwit the Luftwaffe may have played an important role, the reality was that almost every mission now met with stiff resistance. Certain parts of the bomber stream were particularly hard hit, and one area of the formation came to be known as the "Purple Heart corner."

On May 19, 1943 Churchill and Roosevelt decided the date for the cross-Channel invasion of Europe as not later than May 1, 1944.

FRENCH RESISTANCE

The French partisan Jean Moulin had returned from England to organize the French Resistance under one leadership. On May 27th, the plan was successful as fourteen Resistance leaders accepted Charles de Gaulle's leadership. However, a month later Moulin was captured by the Gestapo and subjected to horrible torture. He betrayed nobody, however, and died en route to a concentration camp, already unconscious by that time.

The 8th Almost Loses an Ace

On June 26, 1943 there was heavy fighting over the Channel, with several fighter pilots from the 56th scoring victories, while four more were shot down. Perhaps the most remarkable story of the day involved one of the 8th's greatest fighter pilots.

FW 190s had damaged his plane, and now Lt. Robert S. Johnson had his hands full keeping the Thunderbolt under control. The Focke Wulfs' cannon and machine guns had shot part of the wing, set fire to the engine, and torn up the cowling and fuselage. Time to bail out. Unfortunately the damage to the plane extended to the canopy and it wouldn't open.

Johnson's fate was now linked with that of his Thunderbolt, and he cut the engines in a successful attempt to stop the fire. Then, restarting the engine, he found that it would still perform at low power. Crippled, but still airborne, he started back toward his base.

"However, things were far from over for the day. A Focke Wulf dropped down and caught up with him easily. The Luftwaffe pilot pulled alongside, waved to him and dropped back on the tail of the Thunderbolt to deliver the coup de grace. Johnson made himself as small as possible and shuddered as bullets and cannon shell pounded the armor plate behind his seat. He pushed the stick forward to get under the 190. The enemy overran, but lined up again and gave him another burst.

Johnson was now headed for England. The German pilot pulled alongside again and motioned for him to land and surrender. Johnson would have none of it. Another wave of the hand and the Luftwaffe pilot went back at it again. Once more the P-47 shook under the pounding from the 190's guns, but it kept flying. For the last time the enemy pilot pulled alongside. Apparently all his ammunition had been expended. This time he threw up his hands in resignation and peeled off for home. Shortly thereafter Johnson brought to England the most damaged fighter plane that anyone had ever seen." (from **The Mighty Eighth**.) If it had not been for the durability and heavy construction of the P-47, Johnson might never have survived to become one of the top aces of World War II.

HIDING THE EVIDENCE

In June, perhaps seeing that victory was in doubt, Himmler ordered the creation of a special squadron whose job was to dig up the mass graves and burn the corpses of dead Jews and Russians in an effort to hide the evidence of the grotesque slaughters perpetrated in the concentration camps. This squadron was led by an SS colonel, Paul Blobel and was known as "Blobel's Commandos." Forcing Jewish slaves to dig up the rotting corpses, Blobel's troops further required the corpses to be searched for gold teeth and gold rings. Then the bodies were burned, the bones crushed to powder, and the powder scattered.

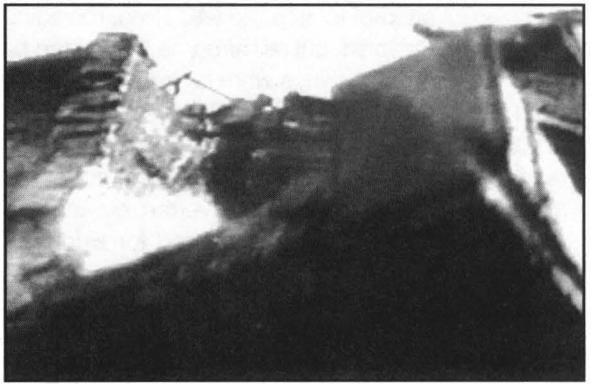
Meanwhile, at Auschwitz, the Concentration Camp Inspector, SS Major General Richard Glueks decided that the gas chambers (known as 'special buildings') were too visible and ordered them moved and a line of fast-growing trees planted to prevent 'all kinds of people' from 'gazing' upon them.

Despite the fact that the Nazis were trying to hide evidence of their atrocities, if anything, they stepped up the pace of the mass murders, so-called 'medical experiments' and other victimization of innocent people.

ARE WE BEASTS?

Also in June, while watching films of successful bombings of German cities, terror raids designed to destroy the will of the German people, Churchill at one time exclaimed, "Are we beasts? Are we taking this too far?" In answer, Richard Casey, a guest of Churchill's and a member of the British War Cabinet was to write, "I said that we hadn't started it, and that it was them or us."

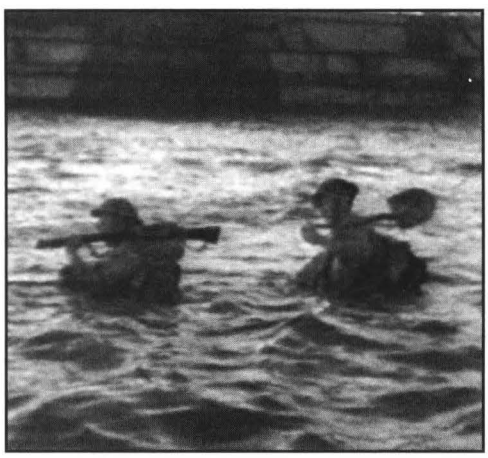
KURSK AND SICILY



In early July, the Germans planned yet another assault on a key Russian city. This time Kursk was targeted, and Hitler planned a surprise attack along a 200-mile long front. Lined up on opposite sides of the line were 6,000 tanks and 4,000 aircraft. However, Hitler's surprise was ruined when the Soviet forces unleashed an artillery barrage more than two hours before the German attack was to begin.

Hitler believed the battle for Kursk to be of critical significance, as is evidenced by a message he sent personally to his troops in the field: "This day you are to take part in an offensive of such importance that the whole future of the war may depend on its outcome. More than anything else, your victory will show the whole world that resistance to the power of the German Army is hopeless."

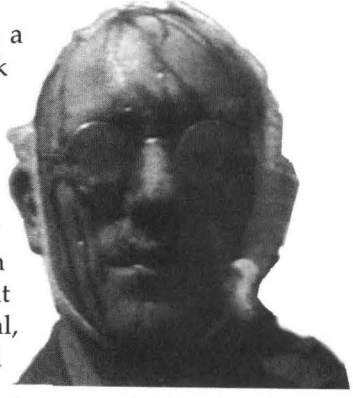
Five days later, the battle still raged, and the outcome was still in doubt. Meanwhile, the Allied forces completed their long-awaited invasion of Sicily, landing 160,000 men and 160 tanks on the island. The invasion of Sicily was important both because it established a major foothold in the Italian theater and because it sent a message of renewed hope to many of the enslaved and embattled people in other countries.



Allied troops landing on the beaches of Sicily.

On July 12th, a massive tank battle took place at Prokhorovka. With 900 tanks on each side, the clash was bloody and violent. In the end, despite heavier losses, the Russians were able to blunt the German attack and hold Prokhorovka. Elsewhere, the Soviet army attacked German-held Orel, forcing the Germans to dissipate their troops and taking the initiative away from the attackers.

Two days later, Hitler was forced, for the first time, to recall a planned attack after only a few days. It was clear that the Kursk offensive had failed. Thousands of German soldiers had died and perhaps 3,000 tanks had been destroyed. The Russians had captured as many as 5,000 vehicles, including, according to one source, almost 1,400 airplanes and 844 field guns.



German POW in Russia.

At the same time as the Kursk offensive was officially abandoned, the first war crimes trials of the war were carried out in Russia where eleven Germans were accused of mass murder. Eight were found guilty, sentenced to death, and shot. Evidence in the trial, which was attended by journalists from the Allied countries, revealed some of the methods used by the Germans, including the 'gas vans' used to transport and simultaneously gas prisoners to death.

Gen. Bradley.

The Americans weren't entirely free of the taint of instant reprisals. In Sicily, 36 Italians were shot after surrendering to the Americans, who had suffered many casualties from sniper fire. In another incident, 45 Italian soldiers and three Germans were sent behind the lines for interrogation, but the sergeant in charge stated that he was going to kill the "sons of bitches" and mowed down the prisoners with a machine gun. When word of this incident reached General Bradley, he reported it to General Patton whose comment was "tell the officer responsible for the shootings to certify that the dead men were snipers or had attempted to

Gen. Patton in Sicily.

escape or something, as it would make a stink in the press and also would make the civilians mad. Anyhow, they are dead, so nothing can be done about it." Bradley did not follow Patton's suggestion, however, and the sergeant and his commanding officer were both brought up on charges. The sergeant was sentenced to life imprisonment while his captain was found not guilty. Later, the captain was killed in action and, after a year, the sergeant was released and returned to active duty.

BLITZ WEEK

With predictions of good weather in late July, Eaker saw the opportunity to begin a series of heavy raids against the German industrial targets. Beginning on July 24, 1943, the largest missions yet were assembled and sent off. For several days the bombers attacked targets in various parts of the German territories, achieving more success than previously. At the same time, the British Bomber Command began Operation Gomorrah against Hamburg, effectively destroying that city in bombings night after night. On the 28th, they were to ignite a firestorm that destroyed more than a third of the buildings in the city and killed 42,000 people. Temperatures in the heart of the storm reached 1,000º Centigrade and winds of more than 300 miles per hour whipped through the city. Remarkably, Hamburg's industrial production was to exceed its pre-firestorm levels within weeks of this disaster.

Meanwhile, the situation in Italy had deteriorated. Faced with the real threat of invasion by the Allied forces and his own ill health, Il Duce, Benito Mussolini, was a broken man. His will to continue the fight as Hitler's ally had gradually diminished, but the Führer had always forced him to continue, bathing him in endless rhetoric and dominating him with his madness. However, on July 25th, his own people took matters into their own hands. With the help of the Italian Army generals, the King, Victor Emmanuel, had Mussolini arrested and Hitler's main ally in Europe was out of the picture. According to reports, Mussolini hardly protested his removal from power, even wishing his successor luck as he was taken away.

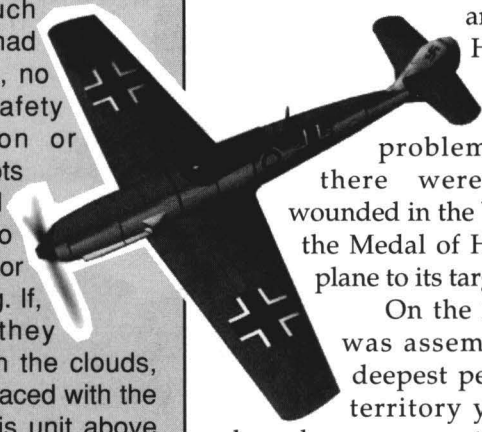
Der Führer and Il Duce had seen better days. Now, Mussolini was worn out.

The Germans were severely shocked by this occurrence, but eventually contrived to explain it to the German people as a voluntary retirement due to ill health. Regardless of what Dr. Goebbels' Nazi propaganda machine had to say, the Italian fascist regime collapsed rapidly as the government changed hands.

The Weather—The Luftwaffe's POV

"While the attacking units flew in at an altitude of 21,000 to 24,000 feet, above the bad weather, in radiant sunshine, high above rain, snow, or the icing-up danger zone, completing their effective raids with excellent navigational aids and bombsights, and while they took off, assembled, and landed again in tolerable weather conditions in England or Italy, our defending units, by force of circumstances, often had to be sent up in the very worst of weather. Neither crews nor aircraft were prepared for such demands. The fighter aircraft had no instruments for blind flying, no de-icing of the cockpit, no safety arrangements for navigation or automatic pilots. Only a few pilots had sufficient training in blind flying. Most of them had no knowledge of instrument flying or bad-weather methods of landing. If, despite all the difficulties, they succeeded in breaking through the clouds, then the leader of the unit was faced with the insoluble task of assembling his unit above the clouds. Thus the planned operational strength never came into being. The result was that the attack had to be made by numerous small units. The defensive fire of the bombers and the escorting fighters took great toll of our force. Numerous German pilots were sitting in their completely iced-up cockpits, half blinded, to become an easy prey for the Thunderbolts. The appalling losses of this period were plainly due to the weather. The fact that, despite all objections, such forced actions of practically no value were demanded over and over again the the High Command shattered once more the confidence of the squadron in the leadership." (from **The First and the Last**.)

On July 26 several raids were sent against various targets involved in German industry. A few of these missions were successful, and there were many heroic actions taken. In one case, the pilot of *Ruthie II* was severely wounded in the head and slumped over the controls. His co-pilot, Flying Officer John C. Morgan, was forced to fly the plane while fighting the pilot's weight against the controls. Flying one-handed, with the other trying to restrain the wounded pilot, Morgan managed to keep the B-17 in formation for more than two hours before anyone came to his aid. His flying had been so steady that nobody had suspected any problems in the front, and there were several severely wounded in the back. Morgan received the Medal of Honor for piloting the plane to its target and back safely.



On the 28th, a massive force was assembled to attempt the deepest penetration of German territory yet, but many of the planes became separated in the bad weather. Some groups reported being fired upon by Bf 109s equipped with rocket launchers, but the rockets were largely inaccurate and did little damage.

On the main mission, the fairly new commander of the 94th group, Col. Fred Castle, decided to lead the mission personally. He had recently replaced a popular commander, and there was some natural resentment among the personnel. However, on this mission he gained the undying respect of his men when he successfully led the attack on Oschersleben, deep in Germany, and found a way to deliver a remarkably accurate bombing on the aircraft factory there despite heavy

cloud cover. The resulting damage closed the factory for a month, which was the equivalent of 50 FW 190s. Moreover, not one aircraft was lost on the mission.

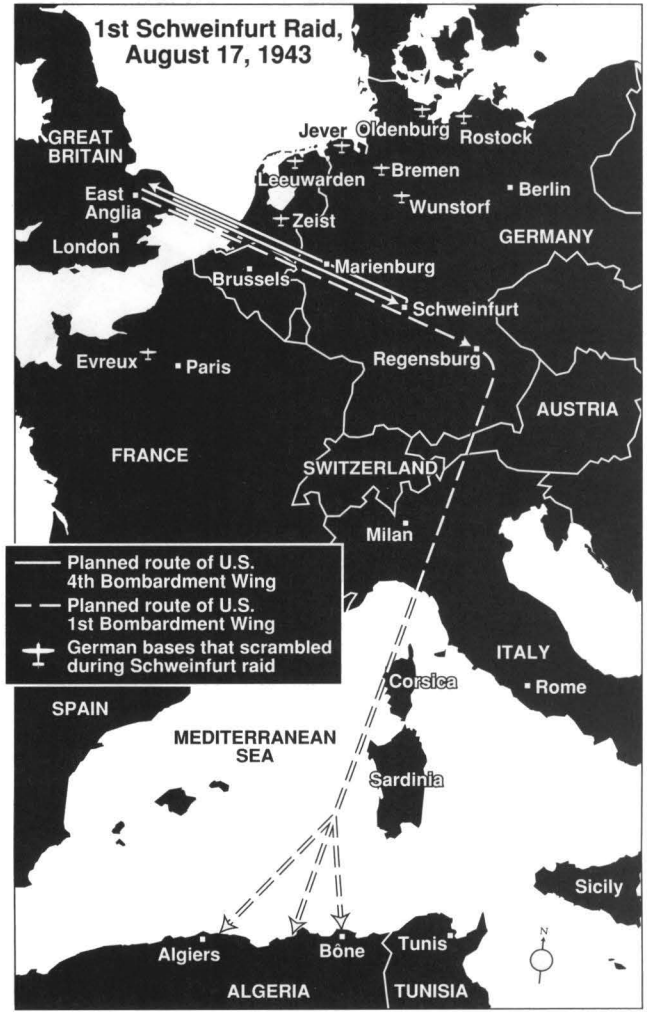
This relatively safe mission was, unfortunately, the exception. Although the bombing during Blitz Week was more effective than in previous months, the cost was extremely high. Of just about 330 bombers in service at the beginning of the week, about 100 had been shot down or had to be scrapped due to extensive damage. Even worse, the equivalent of 90 crews were either killed, wounded, or missing. There weren't enough trained men to replace them. Therefore, even though fair weather greeted the end of the month, and new drop tanks had extended the range of the P-47 escorts, no missions flew on the last day of July.

SCHWEINFURT

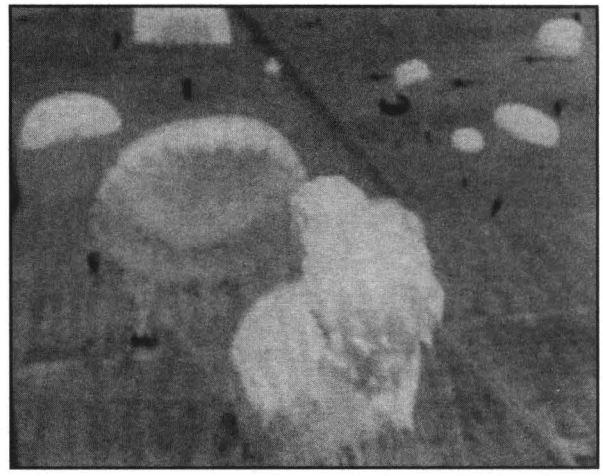
In the latter half of August, most of the missions flown by the bombers of the VIII Bomber Command were directed at targets in southern France as part of a deception plan called STARKEY that meant to confuse the Germans into anticipating an invasion near Pas de Calais. However, on August 17th two major missions were scheduled. The first involved bombers from the 4th Wing who would fly over Germany, bomb the important Messerschmitt factory at Regensburg, and continue on to bases in North Africa. In order to split defenses, a second major attack, leaving about an hour later, was aimed at the all important ball-bearing factories at Schweinfurt, returning to England after completing their run.

Both attacks were delayed due to heavy fog at take-off, but LeMay, commander of the Regensburg force, had practiced for such a possibility. His bombers did eventually get going. 147 B-17s, each with a 5,000-lb. bomb load, took off, and after further delays while establishing all the groups in formation, they began their mission.

Further inland, the fog and mist were even thicker, and the 1st Wing,



who had not practiced for low-visibility formation, was still grounded. The original plan had anticipated sending most of the available P-47 escorts with the 4th Wing to engage the enemy while the Schweinfurt force flew in too quickly for the fighters to refuel and intercept them. However, the delays jeopardized this strategy. As always, timing was of critical importance to the success of the mission, and bad timing was often their undoing.



The sky was full of 'chutes during the two raids.

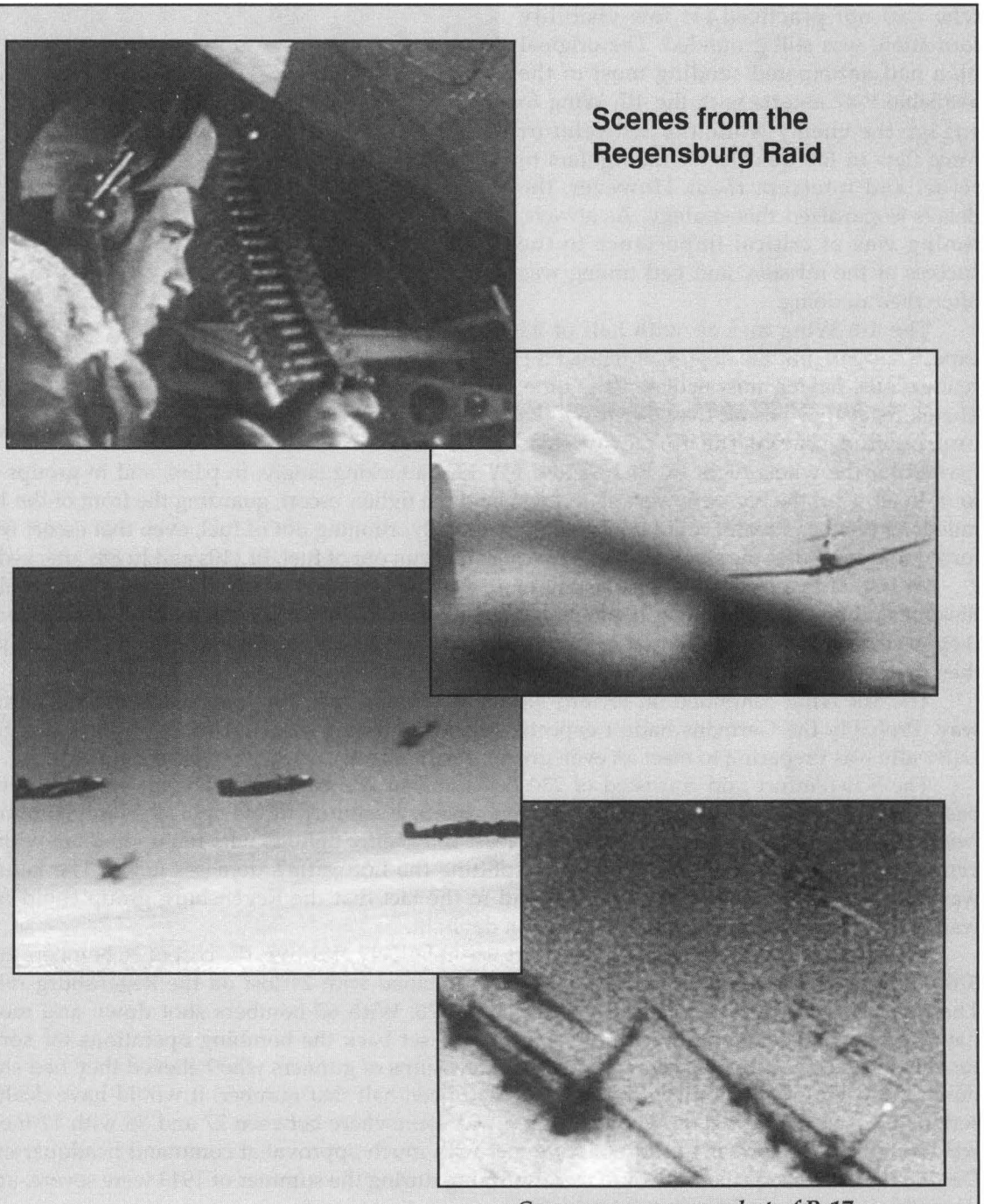
The 4th Wing met up with half of its expected escort, but the other half missed the rendezvous, having miscalculated the time. Therefore, as they passed over Germany, the unprotected rear of the formation was harried for the whole flight by Bf 109s and FW 190s attacking singly, in pairs, and in groups of four. In all, 17 of the bombers were shot down, and the fighter escort, guarding the front of the 15-mile long bomber stream, could do nothing. Eventually, running out of fuel, even that escort was forced to leave. After the single engined attackers had run out of fuel, Bf 110s and Ju 88s attacked.

At last, after a constant attack lasting more than an hour and a half, the Luftwaffe virtually disappeared and the remaining bombers had a clear run to the target. Their aim was good, and they destroyed not only the Messerschmitt factory, but also the fuselage jigs for the Me 262 jet, then in development.

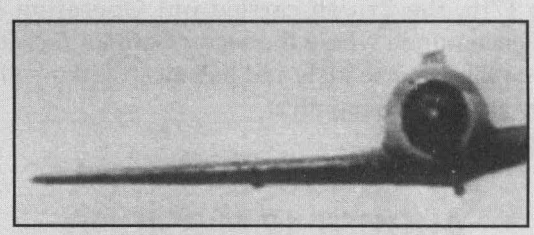
The 4th Wing continued on toward North Africa, and met little opposition the rest of the way. Probably the Germans hadn't expected them to go that way, but more importantly, the Luftwaffe was preparing to meet an even greater threat already on the way from England.

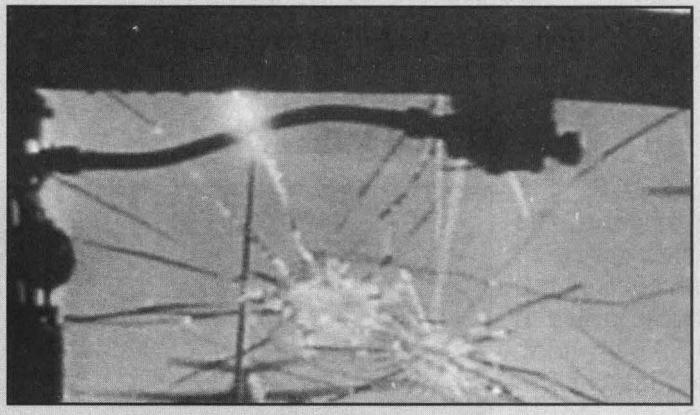
The Schweinfurt raid consisted of 230 B-17s in four combat wings. Flying along the same basic route taken by the Regensburg bombers, the Schweinfurt forces split at Mannheim and headed for their target. They were met by at least 200 enemy fighters who fell upon them with a vengeance. It was obvious that the idea of splitting the Luftwaffe's defenses failed. The failure was due in part to disparities in training and to the fact that the Regensburg group could not wait longer. They had to reach North Africa in daylight.

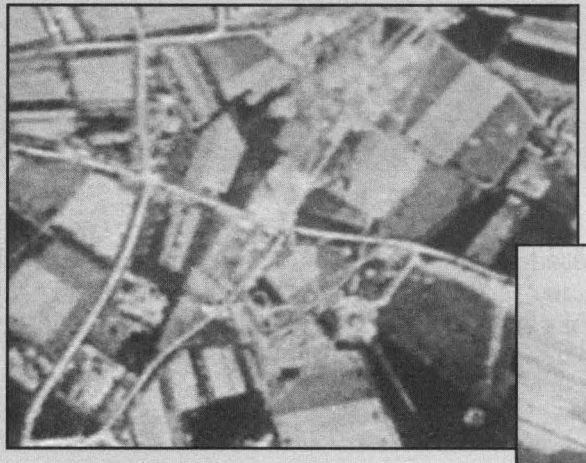
Even though the bombing at Schweinfurt was relatively effective, the cost of 36 bombers and 370 airmen was unacceptable, especially when combined with 24 lost on the Regensburg raid. The previous high for a day had been June 13 at 26. With 60 bombers shot down and more damaged beyond redemption, this day could have set back the bombing operations for some time. However, these losses were mitigated by the claims of gunners who believed they had shot down 288 enemy fighters. Even if this figure had been half that number, it would have dealt a serious blow to the Luftwaffe. The real figure was somewhere between 27 and 36 with 12 more written off, a number that would not have met with much approval at command headquarters. Despite that, the losses the Luftwaffe were suffering during the summer of 1943 were severe, and their situation was anything but encouraging.



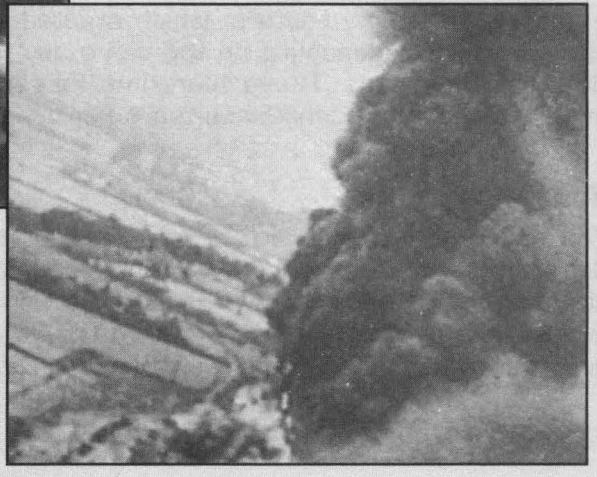
German gun camera shot of B-17s.







Regensburg from the air.



After the bombs...

On the night of the 17th, the British carried out Operation Hydra, an attack on the experimental facilities at Peenemunde where the secret German rocket plans were taking shape. In the raid, they managed to kill 130 scientists and technical staff members of the team and to set back the rocket program by at least two months.

AUGUST 17 MISSIONS

Intercept Raid On Schweinfurt

BF 109 MISSION 1

On August 17, 1943, the Eighth Air Force targeted the town of Schweinfurt, home to more than fifty percent of the ball bearing manufacturing in Germany. The U.S. high command hoped that destruction of these factories would seriously hamper the German industrial war effort. This mission was also a test of General Eaker's belief that the heavily armed B-17s could survive without fighter escort. During the fight to and from Schweinfurt the fortresses ran a gauntlet of enemy fighters, which exacted a heavy toll. This raid combined with the effort against Regensburg on the same day, cost the Eighth Air Force 60 B-17s and 600 crewmen lost. These fearsome losses inflicted by the Luftwaffe fighter arm began to shake the confidence the Americans had in their bomber offensive.

Get the outside bomber with a rocket.

Your Mission

You and your wingman are perfectly positioned to attack a squadron of B-17s near Schweinfurt whose escort of P-47s has long since headed home. Your best strategy for attacking the tight formation of B-17s is to work at the outer edges of the formation first, avoiding the concentration of fire from the gunners in the center. Be patient and slowly pick off the least defended planes in the formation.

Strategy

There are three groups of three B-17s making their way to the target. The B-17 crews are relatively green and will have a hard time shooting you down. Use your rockets sparingly and attack the outside/rear bombers first in the formation.

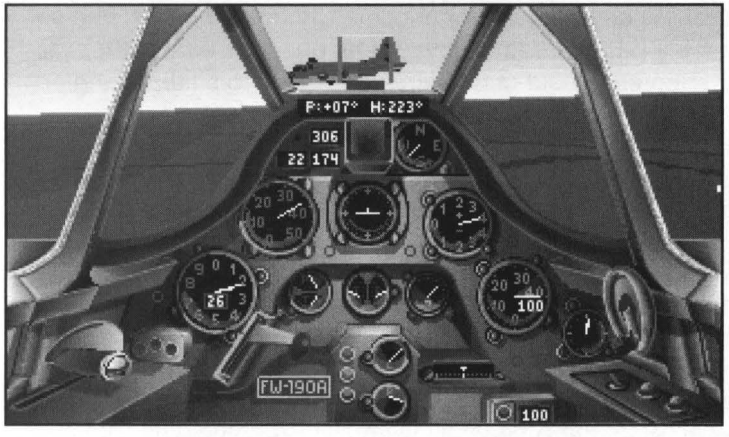
FW 190 MISSION 2

This is the same operation as Bf 109 Mission 1.

Your Mission

Your four-plane schwarm of FW 190s is on an interception course with a large strung-out formation of B-17s west of Schweinfurt. The U.S. bombers are without the protection of their fighter escort. Decimate the bombers before they can release their bomb loads on the vital ball bearing factories.

Strategy



There are 12 B-17s in this mission. The bomber crews are not very good but you still have to be careful. Use your rockets conservatively. Attack the bombers at a distance with your machine guns to soften them up. As you move inside use both your cannons and your guns simultaneously. This method of attack will help conserve your cannon shells. Take your time and attack one bomber at a time.

MOVES AND COUNTERMOVES

After the carnage of the first Schweinfurt raid, things slowed down a little. Smaller raids were mounted as part of the STARKEY campaign of deception, but few major raids into Germany were sent. On the 22nd, an experimental rocket landed on an island in Denmark instead of in the sea, which is where the Germans would have preferred it to land. Photographs and sketches of the rocket were sent to British intelligence by Lieutenant-Commander Hasager Christiansen who was later captured by the Nazis and tortured. He was eventually rescued, however, and smuggled into Sweden.

There were many moves and countermoves in the spy game between the Allies and the Axis. In one such move, an August 18th *London Times* article reported the sabotage of an electricity generating plant in East Anglia which resulted in the deaths of more than 150 workers. However, such an act of sabotage never occurred. It was a part of Plan Bunbury, which was designed to lend credence to a pair of German secret agents who had turned double agents and were known to British Intelligence as Mutt and Jeff.

One interesting mission occurred on August 27th and involved 187 B-17s with 368 2000-lb. bombs. These were vectored on some installations along the French coast, but nobody knew what they were. In fact, they were the first V-1 sites, and, with the cement still wet, they were

Gee, Oboe, and H2S: Navigation

The British had developed several navigational systems to help their night bombing missions, and these were slowly adopted for use in B-17s. The first to be employed in the B-17s was called Gee. Using the time lag between signals from two positions, navigators using Gee could fairly accurately establish their position. Flight Lieutenant Bob Reynolds, a Lancaster bomber pilot for the RAF, described Gee as a system of cross grid lines on the screen. "Now every aircraft, being independently flown, obviously some could be a quarter mile to the right or a quarter mile to the left, but if you imagine, say that's the target, the first aircraft comes along dropping its stick. Then another aircraft comes along and drops, and so on. The bombs will all fall within a fairly narrow area. Some will hit dead on, while other will destroy pipes and electrical circuits. Somebody out of 500 aircraft is going to hit that bang on the nose. "

"Whereas the RAF bombers depended on dropping their sticks of bombs independently (though probably within seconds of each other), in the American planes, they flew in formations. When the lead bomber dropped his bombs, all the planes also dropped theirs. Now the result was that if they hit the target, I mean it was dust. If they missed the target, they missed. The way we bombed, at least one bomb would hit it and the surrounding area was also hit. It was almost fifty-fifty. If they hit it, it was gone forever. If they missed, though, they had to come back the next day or rely on another squadron."

Back in August 1942 they had created a new Group, the 482nd (Pathfinder) specifically to use specialized navigational equipment, which was still in short supply, and lead the bomber streams. By October 1943, the Americans were still experimenting with two other British navigational aids—Oboe and H2S.

Oboe fit easily into the B-17 and used signals from different ground stations to guide planes accurately to their targets. The other, H2S, was an early radar which would show the topography of the ground on a cathode ray tube. Bob Reynolds again: "You are in the middle and you have this arm going around, and it picks up the coastlines and the rivers and the cities. The cities were crystal clear, and especially the coastlines and the rivers." Early versions of H2S were often unreliable and they earned the nickname Stinky. However, despite reliability problems, H2S-equipped bomber groups generally proved to be more effective at dropping bombs through cloud layers than unassisted groups, and the potential of this new radar system was considered worth exploring.

virtually annihilated. This was the first of many raids on the V weapon sites that were sent under the code name Crossbow.

Elsewhere, the Allies had secured Sicily and now threatened Italy. Bombers had already attacked several Italian cities, and peace negotiations had proceeded since the removal of Mussolini from power, despite the Italian king's assurances to remain with Germany. Finally, on September 3rd, the fourth anniversary of Britain's declaration of war against Germany, Italy formally capitulated. It wasn't many days later that the Germans, having anticipated Italy's defection, implemented Operation Axis and invaded their former ally. Many Italian soldiers were executed. Others were taken prisoner and deported to the slave labor camps. There was little resistance, though some troops and remnants of the Italian navy were able to join forces with the Allies.

On September 6, the weather once again contributed to a disaster for the VIII Bomber Command. For the first time a raid of more than 400 planes was sent out toward a bomber factory near Stuttgart, but the cloud cover was very heavy, and many realized too late that it should have been aborted. However, the bombers continued on, meeting light resistance—an ominous sign in itself— until the bombers met heavy fighter attacks near the target. The attack on the factory was aborted, but the Luftwaffe continued to attack. While the Luftwaffe took its toll, fuel shortages forced another 12 bombers to ditch in the Channel, but the RAF rescue teams were able to save all the crewmen involved. In all, the Stuttgart raid cost another 45 bombers shot down or lost to fuel shortages and other equipment problems.

Meanwhile, the Germans were in retreat in the Soviet Union, where they destroyed industry, mines, and other assets as they fell back. Nearly half of the territories gained since 1941 had to be given up. The Germans had lost 548,480 men in the Russian campaign and another 2 million wounded.

Despite the increasing hardships and losses facing the Germans, their propaganda arm continued to churn out its share of pro-Nazi information. For instance, on September 4, Lord Haw Haw, a propaganda personality on the radio broadcast to Britain from Hamburg with the following optimistic message: "Now that we have arrived in the fifth year of the war, I will

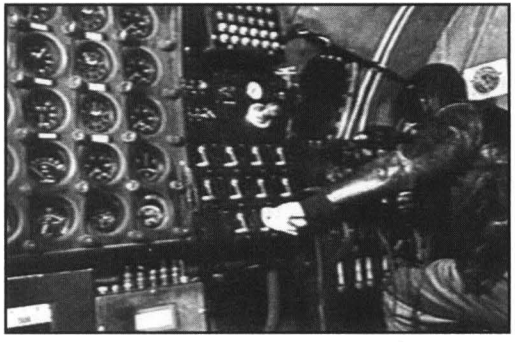
Heavy Artillery

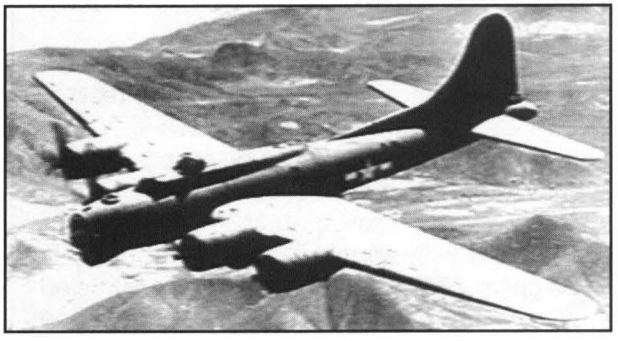
The Germans were always trying to find ways to deliver a knock-out blow to the Fortresses. One idea recounted by Adolf Galland was to "use a large-caliber long-distance cannon against the American bomber formations. The result was as follows: an ME-410 destroyer, equipped with armored-car cannon KWK 5, weighing 2000 pounds (!), was reconstructed as an automatic weapon with a magazine holding about 15 shells, rate of fire about one shot per second. It was possible to fly with this monster sticking 3 yards out in front; firing was possible, too, although the cannon jammed hopelessly after about five shots. One could even hit something, not at 1000 or 3000 yards' distance, but at the most from 400 yards! Beyond that all chances of a hit were spoiled by having to fly the aircraft. Nothing was gained, therefore, and firing was reduced to single shots. We used to say ironically that we had only to shatter the morale of the bomber crew by a few artillery shots, then we could ram the Mustangs and Thunderbolts with our gun barrel." (from **The First and the Last**.)

only say that German victory is certain. The German people know that while many blows are yet to be struck, the final blow will be struck by Adolf Hitler." At least on the radio, Germany was still victorious, if nowhere else.

On September 9, the U.S. Fifth Army (composed of the British X and U.S. VI CCorps) landed at Salerno. They met little resistance at first, and were able to establish a beachhead. Meanwhile, Field Marshal Kesselring mobilized the XIV Panzer Corps and counterattacked on September 12, very nearly breaking the Allied lines. The Allies held, though, and were able to bombard the German attackers with sea and airborne bombardments. By the 16th, the Fifth Army was able to push out from Salerno and unite with Alexander's Fifteenth Army Group. The critical phase of the Italian invasion was now considered past. Now began the long, slow march toward Rome. It was to prove an even more difficult task than was expected at the time.

IMPROVING THE ODDS?





The new B-17G inside and outside.

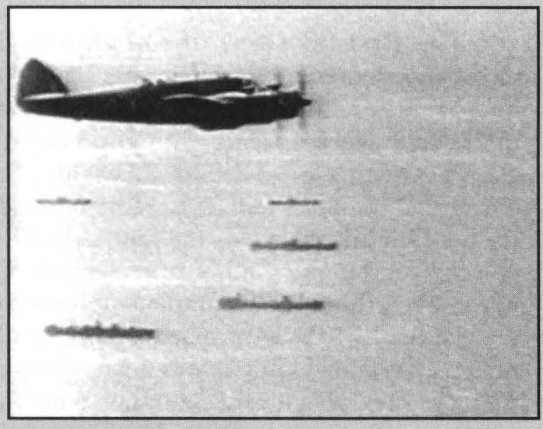
The USAAF was always trying to improve equipment in order to make the bombers more effective and safer. Among the improvements tested were various types of navigational equipment (see sidebar), rack-mounted exterior bombs for short missions, and new gun turrets. In September, a new version of the Fortress, the B-17G, was introduced. Like the ill-fated YB-40, a ponderous and ineffective experiment in flying armament, this had a gun turret in the front to protect against the all-too-effective frontal assault used by the Luftwaffe. Some B-17Fs were also retrofitted, but most flew on as they always had.

But October of 1943 was to prove the need for one improvement more than any other. It was the long-range escort fighter.

OCTOBER, 1943: HEAVY LOSSES

By October, the Nazi leaders had finally begun to recognize the threat posed by the American bomber force, and their fighter wings were shifted to bring more against the B-17s. Where there

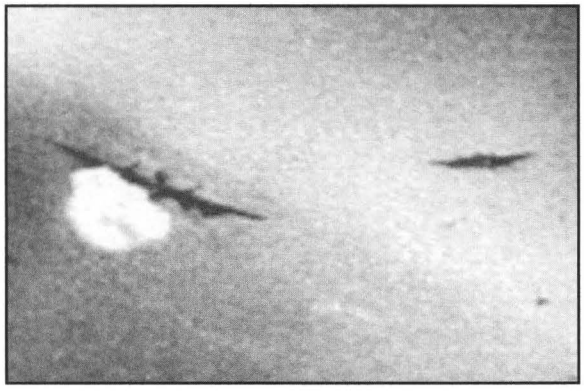
The Allies Invade the Italian Mainland



The Allies crossed the Mediterranean from Sicily and landed at Salerno. Alexander (above left) and Kesselring (above right) were among the commanders who ran operations for their respective sides.

American GIs enter Naples.

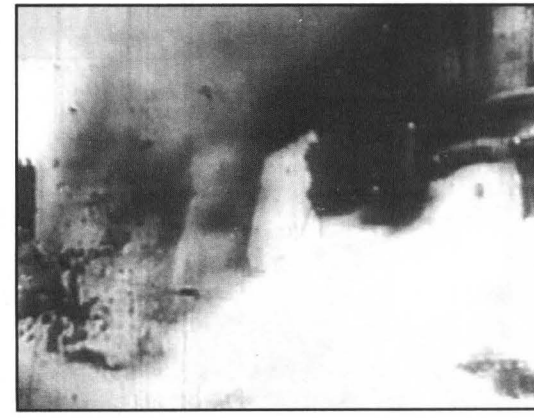
had be about 300 single-engined fighters to oppose the bombers in April, by October there were almost 800. In addition, the Germans had developed all kinds of methods for countering the bomber threat, including improved armor, extra 20 and 30mm cannons, and the 21cm rocket which delivered an 80-lb. timed warhead.



The first missions of the month, on October 4, were mostly unsuccessful due to bad weather, and 16 heavies were lost, including two B-24s, despite good fighter escort. On this day, S/Sgt. Crossley, tail gunner on the *Brass Rail Boys*, received credit for his 12th kill. This was the highest total to be achieved by any gunner in the Eighth Air Force, even though the complete accuracy of his claims, like those of many others, could not be ascertained. Still, it was acknowledged that Crossley was a gifted gunner who was adept at deflection shooting. The majority of gunners used what was called the "zone system," which meant "simply pointing the gun in the direction of the enemy aircraft and filling that area of sky with bullets. Hitting the enemy was therefore a matter of chance to say nothing of the gross expenditure of ammunition." But it made everybody feel good, except the German pilots who had to fly through the tracers.

On October 8, three separate flights were sent against Bremen. Two B-17 divisions and one B-24 attacked from different directions. The Fortresses were met with heavy fighter resistance, and lost many planes. Over Bremen, they encountered murderous flak, further damaging and destroying many more of the heavies. One aircraft, *Miss Carriage* of the hard-hit 100th Group, was nursed 400 miles home on one engine (which itself had received flak damage), and landed safely in England. Many others were not so fortunate. The *Tinkertoy*, already considered to be a jinxed plane, and one of the originals of the 381st, had its pilot killed, but still made it back.

Among those planes least damaged by flak were 40 bombers of the 3rd Division which employed an electronic jamming technique code-named "Carpet" that had been used by the British to foil the radar sights on AA guns. The success of Carpet led to its being installed on more planes over time. Also in use by the British and more and more by Americans was Chaff or Window, metallic paper strips cut to a size that would interfere with the radar and give false readings.



Where the bombs hit.

October 9 saw more heavies take to the air and attack targets at Anklam, Marienburg, and Gdynia and Danzig in Poland. Although attempts at flying low to evade detection were not very successful— intercepted German messages

indicated they had been spotted—all three attacks proceeded. Some success was obtained in Anklam, while smoke screens prevented good bombing on the Polish targets. However, the results at Marienburg were among the best of the year. With minimal AA to contend with, the bombers attacked at a lower altitude (between 11,000 and 13,000 feet) and dropped 58% of their bombs within 1,000 feet of the target and an incredible 83% within 2,000 feet.

The next day, October 10, saw more heavy losses as an attacking force headed for Munster was met with a determined defense by the Luftwaffe. In addition to the usual tactics, it was reported that Do 217 bombers were now flying parallel to the B-17s and firing projectiles from that position. Still, despite heavy losses once again, most of the surviving bombers continued and dropped their loads on Munster. One group, the hapless 100th, who had experienced continual losses almost in every mission, lost 12 of the 13 bombers it sent up. There was even talk that the Luftwaffe had a special grudge against them. Whatever the reason, the 100th group became known as the jinxed outfit.

OCTOBER 10 MISSIONS

P-47 MISSION 4

Rescue at Munster

On October 10, 1943, the Eighth Air Force targeted Munster, a vital crossroads in and out of industrial Ruhr. A force of 274 B-17s was sent with the 13th Wing, composed of the 95th, the 100th, and the 390th acting as lead. During the flight to Munster these bomber groups suffered very heavy losses. As they withdrew, their formations were scattered, making them especially vulnerable to German fighter units who were looking to attack stray B-17s. The 56th Fighter Group arrived on scene as the B-17s were set upon by the FW 190s and Bf-109s. Only the heroic efforts of Dave Schilling and Robert Johnson flying P-47s of the 56th prevented the strung out B-17 formation from being totally destroyed.

Your Mission

As a member of the 56th Fighter Group, you are charged with protecting the scattered remnants of the B-17 formation as they head for home. Many FW 190s and Bf 109s are attacking from all sides.

Strategy

You start in the middle of 4 B-17s that are scattered around you. Engage the enemy fighters quickly and shoot them down as fast as you can. Make sure you stick with the bombers. If you get too far behind, the enemy fighters will certainly shoot them down.

B-17 MISSION 6

The 100th BG at Munster

This is the same operation as P-47 Mission 4. Two days before this mission, the 100th Bomb Group had suffered heavily at Bremen. The attack on Munster proved even worse as vicious German fighter attacks the lead wing comprised of the 100th, 390th and 95th Bomb Groups. Of 13 planes in the 100th, 12 planes were destroyed over Munster. For this sad fate it earned the nickname the "Bloody" 100th and became known as a jinxed outfit.

Your Mission

You are the sole survivor of the 100th on your way to Munster. Just ahead of you are the remnants of the 390th Bomb Group. Before the next wave of enemy fighter attacks, quickly join their formation to get some protection. Follow them to the target and drop your bombs. Don't try to go it alone!

Strategy

You're straggling behind a group of B-17s that is above and ahead of you. Increase your power and climb to catch up with this group. Maneuver your plane into the open formation slot to the rear of the group. Follow the group to the target. Once you reach the target, use the timer to release your bombs. Don't rely on the message given by the flight leader.

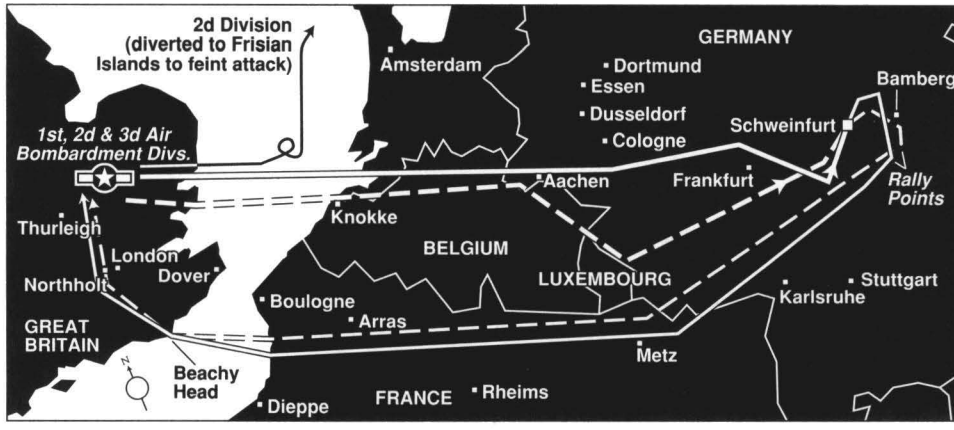
RETURN TO SCHWEINFURT

Thursday, October 14th was the day picked for a return to Schweinfurt. Although the original plans for this raid called for 400 bombers, in fact fewer than 300 were able to take off. Of the 60 B-24s that were supposed to fly the mission, only 29 were able to get airborne in the heavy weather, and they were sent on a diversionary flight. 291 B-17s in two divisions took off that morning. The 1st Division, taking a direct route, met fighter opposition almost immediately past Aachen where their P-47 escort had to turn back. The 3rd Division, which had taken a less direct path, were able to avoid interception until they made a 90 degree turn over Luxemburg, and even then the opposition was relatively light.

For the 1st Division, the day had not begun well as one of its groups had mistakenly flown with the wrong wing, thereby causing the reorganization of the formation. Because of this, the 91st Group was leading, as they had done on the first Schweinfurt raid.

As expected, the enemy fighters came in at the 11 to 1 o'clock positions and attacked from the front, soon to be joined by Bf 110s shooting rockets from the stern. Three groups, the 92nd, the 305th, and the 306th, were decimated. Heavies fell from the sky and littered the landscape behind the remaining formations, smoke rising into the sky and flashes of guns and cannon firing everywhere. Of the 18 bombers that had started out with the 305th, three had aborted and another 12 had been shot down. Only three made it to the target, where they joined the 92nd for the bomb run.

2d Schweinfurt Raid, October 14th, 1943



Though some good results were obtained in the bombing, the 1st Division continued to lose planes on the way back to base, despite attempting to return by a westerly route and using cloud cover to hide from the fighters.

The 3rd Division, which had enjoyed an easier approach, was attacked in earnest near Schweinfurt. Their bombs fell six minutes after those of the 1st Division, but smoke prevented good visibility. Heading back, the 3rd Division was met at the Channel by more FW 190s, the P-47 escort having had trouble getting airborne in the weather.

Taking stock of the mission, 60 Fortresses were missing while another 5 had crashed in England. 12 more were written off, and 121 were in need of repairs. 600 men were missing while 5 dead and 43 wounded were hauled from the surviving bombers. In fact, the only group that didn't suffer casualties or loss of aircraft was, strangely enough, the luckless 100th.

OCTOBER 14 MISSIONS

P-47 MISSION 2

Escort for Schweinfurt

The American Eighth Air Force Leadership considered the first raid on Schweinfurt a success, thinking that the ball bearing industry had been dealt a severe blow. But photo reconnaissance showed that repairs were quickly being made, so on October 14, 1943 a return raid was planned. For the American B-17 crews who flew this day, the mission proved to be as nightmarish as the first Schweinfurt raid on August 17.

As B-17s crossed the Dutch coast, they were set upon by wave after wave of German Fighters. The escorting American fighters were inadequate in number and could only defend the bombers to the German border. Once the American fighters had turned

for home, the German fighters intensified their attacks and continued them all the way to Schweinfurt. A total of 60 B-17s were lost to the German interceptors. The bombers did heavy damage to the ball bearing plants but the bomber losses were crippling. At this loss rate the American bomber offensive would cease to exist. This raid was the final confirmation that long-range escort was needed to protect the bombers all the way to their target.

Your Mission

Fly your P-47 as escort in front of a formation of B-17s. Clear a safe path for them across Holland and Belgium. Numerous German fighter formations are poised to intercept. Watch your fuel consumption, and stretch your flying time to its maximum.

Strategy

This is a long mission that will require you to stay alert for the duration. During the escort several FW 190s will attack your bomber group. Make sure you stick with the bombers, otherwise the FW 190s will make mince meat out of them. Since your P-47 has limited fuel range, make sure you turn back to base when you reach the Lahan & Rhine river intersection. Otherwise you'll run out of fuel!

B-17 MISSION 3

Raid on Schweinfurt

This is the same operation as P-47 Mission 2 from the bombers' POV.

Your Mission

You fly lead as part of the 100th Bomber Group as it approaches Schweinfurt from the west. You will be attacked by wave upon wave of Bf-109s and FW 190s, some carrying rockets. Keep a tight formation allowing each plane to give mutual protection to the others.

Strategy

As you make your way to the target, make sure you keep your speed the same as that of the others in y our group. If you speed up, the other bombers will experience engine problems. Use your top turret to scan the skies. As you get attacked by the enemy fighters, shoot early to scare them away and conserve your ammo. Once the fighters are scared off they'll return home.

BF 109 MISSION 2

Return to Schweinfurt

This is the same operation as P-47 Mission 2 from the 109 pilot's POV.

Your Mission

Flying a Bf 109 from JG 26, intercept the American attack as it crosses the Dutch coast. The B-17 formation in your sector is being escorted by P-47s. Your mission is to tangle with the P-47s, drawing them away from the B-17s, so that the FW 190s following your attack can hammer the bombers.

Use machine guns and cannon to destroy the bomber.

Strategy

In this mission your priority should be the escort fighters so that the FW 190s can get in and demolish the bombers. If the FW 190s can make a few passes at the bombers, there will be fewer bombers that you'll have to shoot down in the end.

FW 190 MISSION 5

Second Schweinfurt Attack

This is the same operation as P-47 Mission 2 from the FW 190 pilot's POV.

Your Mission

Flying a FW 190 from JG 26, intercept the American attack as it crosses the Dutch coast headed for Schweinfurt. The B-17 formation to the west is being escorted by P-47s. Press home a rocket attack, then swing around again for a full machine gun and cannon attack.

Strategy

Climb above the P-47 escort and fly directly to the bombers. Avoid engaging the P-47s if you can. Use your rockets sparingly and make fast attack runs on the bombers from above. Use your machine guns at a distance and both your machine guns and cannons closer in.

ASSESSING THE DAMAGE

The official response to the second Schweinfurt raid was one of satisfaction. The apparent destruction of the critical ball-bearing works would constitute a major blow to the German war industry. The loss of so many bombers and men was considered worth it for the lives it would no doubt save in the end. And reports of 288 fighters shot down caused General Arnold to comment, "...the opposition isn't nearly what it was and we are wearing them down." The British Chief of Staff went so far as to say, "The Schweinfurt raid may well go down in history as one of the decisive air actions of this war, and it may prove to have saved countless lives by depriving the enemy of a great part of his means of resistance."

However, the truth was somewhat different from the impression these statements left. That severe damage was done to the ball-bearing factory was undeniable, but it was perhaps less than the reports indicated. However, as usual, the claims of fighters shot down were highly exaggerated. There was a terrible attrition rate among the Luftwaffe, but not the kind of attrition that was reported. And it seemed that, rather than wearing the Luftwaffe defenses down, the American heavies were meeting with more and stiffer resistance.

The plain fact was that, more than any one solution, the need for long-range fighters was at the top of the list. As Col. Curtis LeMay stated, "The more Fortresses we have here the shorter the war is going to be, and the more fighters we have to protect the Forts the smaller the losses will be."

Himmler's Justification

In a speech on October 4, 1943, Heinrich Himmler, the head of the dreaded SS, delivered a speech to his group leaders. "Most of you know what it means to see a hundred corpses lying together, five hundred, or a thousand. To have stuck it out and at the same time—apart from exceptions caused by human weakness—to have remained decent fellows, that is what has made us hard. This is a page of glory in our history which has never been written and shall never be written." Then he added, "We have fulfilled this most difficult duty for the love of our people. And our spirit, our soul, our character has not suffered injury from it." This speech, as much as anything, serves as an example of the kind of insidious double-talk used by the Nazis to justify the horrors they inflicted on so many innocent people.

Later in the speech, Himmler is more direct about his concerns for his victims. "What happens to the Russians, what happens to the Czechs is a matter of utter indifference to me... Whether the other peoples live in comfort or perish of hunger interests me only in so far as we need them as slaves for our Kultur. Whether or not ten thousand Russian women collapse from exhaustion while digging a tank ditch interests me only in so far as the tank ditch is completed for Germany."

A couple of days later, Himmler again spoke out. This time he was matter-of-fact in his justification of the murder of Jewish children. "I decided to find a perfectly clear-cut solution to this too. For I did not feel justified in exterminating the men—that is, to kill them or have them killed—while allowing the avengers, in the form of their children, to grow up in the midst of our sons and grandsons."

He referred to the Jews as "human animals."

ELSEWHERE

The Allies marched toward Rome in October while the Germans attempted to round up the Jews throughout Italy and send them to the death camps. Until now, the Italians had refused to deport the Jews, but now that Germany was in control of so much of the country, they attempted to carry out their Final Solution. However, many Italian Catholics hid Jewish families. Several hundred were even given sanctuary in the Vatican itself. Even though thousands of Jews were caught, many thousands were saved thanks to the decency of the Italian people.

Meanwhile, foreign ministers from the United States, Britain, and Russia met to agree not to make a separate peace with Germany. The Americans agreed to send more than six million tons of supplies to the Russians over the next eight months.

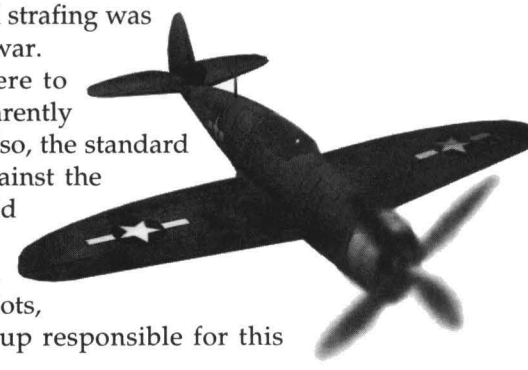
Also in October, a United Nations War Crimes Commission was created to investigate and bring to trial the men responsible for the Nazi atrocities.

ESCORT TO GERMANY

The need to extend the range of the escort fighters was not a new idea. Even before the Thunderbolts had entered the fight, there were those who knew it would not have enough range. And, ironically, drop tanks had already been developed for the P-47s, but none had accompanied the shipments bound for the European theater. These tanks, external bladders of resinated paper, had several drawbacks. They wouldn't function above 23,000 feet, they leaked, and they negatively affected the performance of the plane.

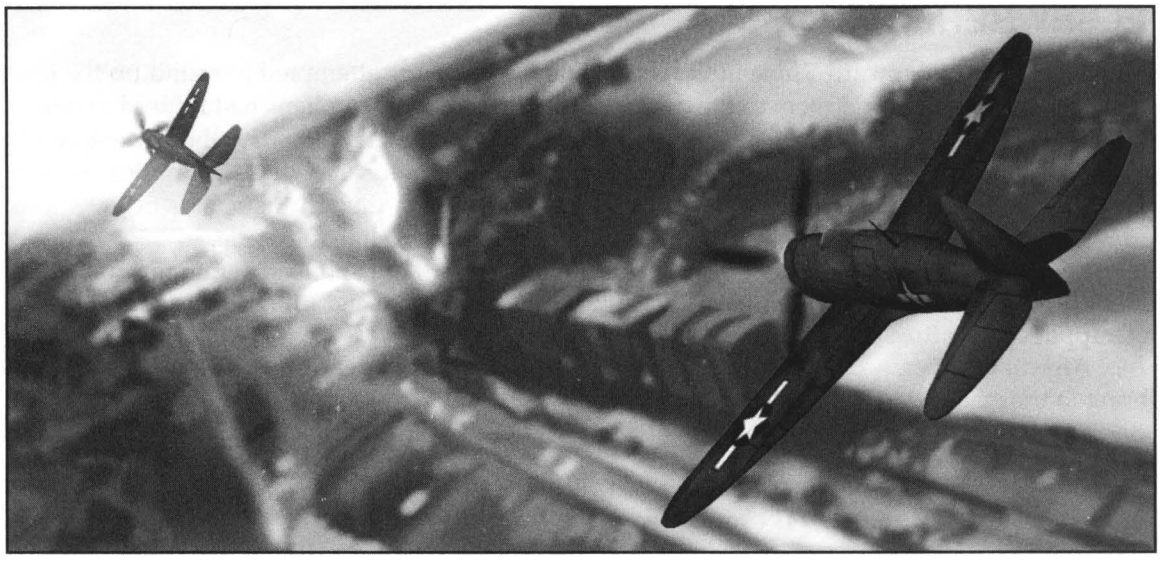
Attempts were made to develop drop tanks that were pressurized to allow them to function at high altitudes and that addressed the other problems inherent in the paper tanks, but the first drop tanks fitted to P-47s were, in fact, modifications of these original tanks due to shortages of sheet steel and other delays in producing the pressurized versions. However, using the drop tanks at low altitudes simply to get across the Channel, the range of the P-47 could be extended 30 to 75 miles. Several times in early July, the Thunderbolt pilots had surprised their Luftwaffe adversaries, scoring several kills, including the establishment of the Eighth Air Force's first ace, Captain Charles P. London.

Another pilot, Lt. Quince L. Brown, taking a low route home, decided to strafe a locomotive passing under him. This was the first time such low-level strafing was to occur, but it became a standard procedure later in the war.



On July 28th, 107 P-47s with extended range were to claim 25 kills against 7 losses. Some of their success apparently came as the Luftwaffe pilots were caught by surprise. Also, the standard Luftwaffe roll and dive maneuver that worked well against the Spitfire, was not effective against the P-47 which could out-dive the Bf 109s and FW 190s.

Again, on August 12, Thunderbolts with extended range were able to score heavily against the Luftwaffe pilots, downing eighteen planes with only one loss. The group responsible for this



damage was led by Major Don Blakeslee of the 4th. Blakeslee was to prove a remarkable leader as the 4th and the 56th Groups contended for leadership as the most successful fighter groups.

It was on the fateful 17th, the day of the first Schweinfurt raid, that the 56th, commanded by Col. Hubert Zemke, made its first bid for superiority. Having already escorted the Regensburg force on the way in, the 56th pilots were back in the air again to pick up the returning bombers from Schweinfurt. Holding their drop tanks an extra ten minutes, despite the potential danger of being bounced with them still attached, the fighters were able to extend their range deeper than expected. They surprised the attacking Luftwaffe fighters and claimed 17 of the 19 enemy planes shot down that day by fighters. Among those shot down was Major Wilhelm Galland, Adolf Galland's brother, himself with 55 air victories to his credit.

By September a new, pressurized "75 gallon" tank (that actually held 85 gallons) was being fitted to the Thunderbolts. This tank was more aerodynamic and more reliable than the old paper tanks, and though the capacity was in theory lower, in practice it was at least as good if not better than the other tanks had been at extending the fighters' range.

On September 27th, drop tanks were used to allow fighter escort for a bombing mission all the way to Emden and back, using three waves of fighters. The result was to take the Luftwaffe defenders by surprise, inflicting 21 defeats against one P-47 lost.

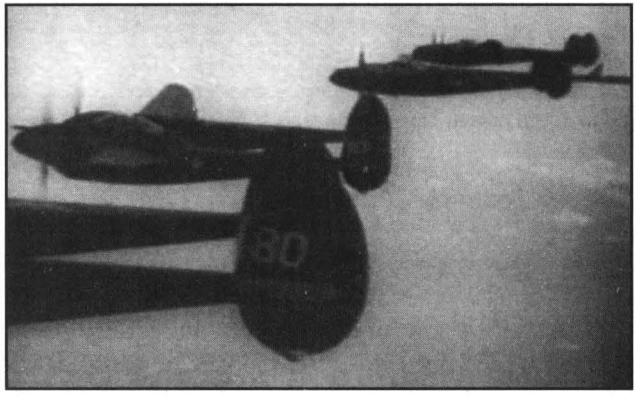
Returning to Emden on October 2nd, the bombers met little resistance as the Luftwaffe was reluctant to rise to the attack. However, on the 4th, the 56th was able to take a group of 40 Bf 110s completely by surprise. The Bf 110s had already proven to be vulnerable to single-engine fighters, and these proved to be the same. Fifteen of the twin-engined Zerstorers went down without taking a single Thunderbolt with them. It's no wonder the Germans were surprised. On this mission, by careful use of the drop tanks and fuel conservation, the 56th had flown their P-47s on a record 750-mile mission.

The Luftwaffe began to understand the situation, however, and started engaging the Thunderbolts as they reached the continent, trying to force them to drop their tanks and lose the

advantage of extra range. However, they rarely gained any advantage by doing this as they sent small forces that could be handled by only a fraction of the escort force while the rest continued onward. And the P-47s continued to outscore the FW 190s and Bf 109s by a substantial margin.

On the day of the second Schweinfurt raid, October 14th, the Luftwaffe again tried that tactic, sending about 20 109s and 190s against the escorting fighters. Five of them were shot down with no losses to the P-47s. Later that day, more German fighters were shot down with the loss of one P-47 while two more Thunderbolts crash-landed in England later.

About this time, some P-38s were beginning to see service, and their extended range was welcome, but the really hot news was of the new, updated P-51 Mustang with the Merlin engine. This long-range fighter caught the imaginations of many pilots when it was mostly still in the rumor stage.



P-38s.

Meanwhile, in early November, the 56th Group became the first to claim 100 kills. Their methods were largely due to the meticulous analysis each mission received from their commander, Zemke. They came to see their job as that of hunters, and it was said that they hunted Bf 109s and FW 190s like wolves. Thus they became known as the Wolf Pack.

As of November 1st, the Thunderbolts experienced a 3 to 1 advantage over the Luftwaffe—237 to 73 with 34 probables and 123 damaged. These results were considerably more reliable than the claims of the bomber gunners, especially as most could be verified from gun camera film. Moreover, after the war it was found that these figures were pretty much in agreement with the Luftwaffe's own records.

However, even more important than score was the effect that fighter escort had on bomber losses. When fighters were present, bomber losses were cut at least in half.

MEANWHILE...

The Red Army continued to push the Germans back. By November, they were near the so-called Panther Line, a barricade of concrete, barbed wire, and mines that Hitler had ordered as far back as August when the probability of a defensive line had been anticipated. On November 5 the Soviets attacked Kiev and, by November 7 they had retaken Kiev and the town of Fastov, thirty miles further west. They had crossed the Panther Line.

In Italy, however, the Allies were finding it difficult to oust the Germans from Rome. In heavy fighting, the Allied forces were unable to gain significant ground.

As November wore on, even the Russian advance slowed, despite Goebbels' diary entry of November 15, which read, "Where will it ever end! The Soviets have reserves of which we never dreamed in even our most pessimistic estimates."

Like many war-torn cities, Kiev paid the price.

Also on November 15, six special agents were flown from Britain to France while twelve returned to England. One of those returning was Francois Mitterand, a Resistance leader whose code name was 'Monier.' Mitterand returned to France two months later to continue work with the Resistance. He was elected President of France 38 years later.

On November 16, a bomber force was able to destroy part of the German heavy water facility in Norway, forcing the Germans to abandon that location and attempt to transport their remaining stocks of heavy water back to Germany. Agents in Norway were able to transmit the German plans to the British, who planned to intercept the shipment. (Later, on February 20, 1944, the ferryboat *Hydro* was sunk by saboteurs. It was carrying that same heavy water.)

On November 22, the British attacked Berlin again at night. This time, they were successful in causing severe damage to the government buildings including the Admiralty, the Air Ministry, the Ministry of Armaments and War Production, and Hitler's Chancellery. Even Hitler's private train, *Amerika*, was damaged, though Hitler himself was in Rastenburg at the time of the raid. In all, more than 1,700 civilians were killed in the raid. Another, equally heavy raid followed the next night.

Even as the Soviets suffered a rare defeat northwest of Kiev, Stalin was meeting with Roosevelt and Churchill in Tehran, the first time he had left the Soviet Union since the Bolshevik Revolution in 1917. At this ultrasecret meeting, the plans for Operation Overlord—the cross-channel invasion—were revealed. There were three conditions that had to be met. First, the German fighter strength in northwestern Europe must be reduced; second, German reserves in France and the Low Countries could not exceed "about twelve full-strength first-quality mobile divisions"; and third, that the Germans be unable to transfer more than 15 first-quality mobile divisions during the first 60 days of the operation.

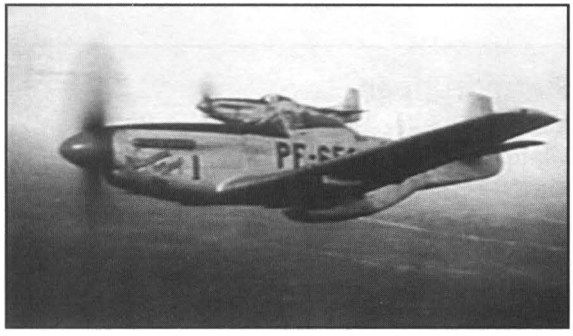
Also at the Tehran meeting, Stalin agreed that Russia would declare war on the Japanese as soon as Germany was defeated. This decision was so secret that it was not even included in the minutes of the meeting.

What Stalin wasn't told was about the existence and progress of the atomic bomb research. However, a few days after the conference, fifteen atomic scientists came from Britain to the U.S. to join the team. Among them was Klaus Fuchs, who was also a Russian spy.

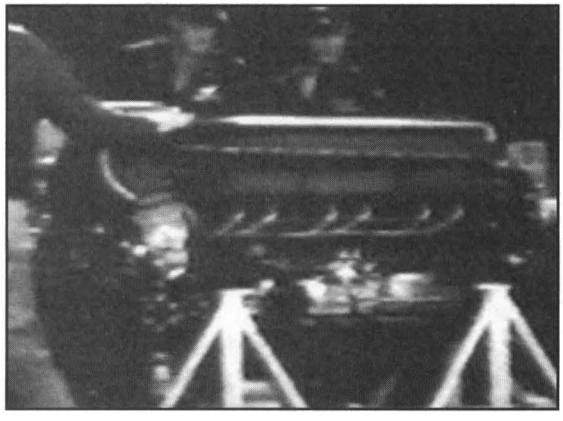
THE MUSTANG

Ironically, when the P-51 first arrived in England, it was allocated to the Ninth Air Force for use largely in recon missions. Despite the urgent need for such a fighter, whose range could be

"This was an honest airplane. I mean, it was great."
—Gen. Thomas Hayes (357th FG)



At first nearly ignored due to a lack of power, the P-51 Mustang was given a new future by the addition of the powerful Merlin engine.



extended to as much as 650 miles under extreme conditions, the history of this airplane had originally led it away from the role it was to perform so well.

In its early history, the P-51 was underpowered. Its Allison engine, designed for low altitude flying, simply wasn't up to the task of fighter escort and general fighter duties as needed in Europe. However, when the British-designed Merlin engine was added, with its extra power, the P-51 took on the characteristics of a formidable fighter. With half the fuel consumption of the P-47s and P-38s, this fighter could reach deep into Germany. The Mustang had superior speed and climb rate, exceptional maneuverability, and could outdive both the FW 190 and the Bf 109 in long dives.

Because the VIII Fighter Command's need for this new fighter was so great, it was agreed that the IXth would fly escort missions under the direction of the VIIIth. The new P-51 group, the 354th under Col. Don Blakeslee, got its first air victory on December 16, 1943. From there on, the P-51 Mustang was to become the dominant American fighter of the war although the more rugged P-47 continued to perform roles both as air support and as ground attack craft. And with continual improvements, even the Thunderbolts were able to penetrate deeper and deeper into German territory.

Early models of the P-51 were plagued by equipment problems, notably guns jamming during maneuvers, but these were eventually worked out. It was also found that the American-built Merlin engines were prone to leakages, and that the American spark plugs were less reliable and shorter-lived than the British versions. In time, however, the Mustang became a reliable fighter and a formidable adversary for the Luftwaffe's fighters. In its early months of operations, Mustang pilots were to score impressively against FW 190s and Bf 109s, once again demonstrating that superior aircraft gave significant advantage.

During the closing weeks of 1943 there were several attempts to use navigational guidance systems to counter the thick cloud cover that obscured most of the targets. Oboe was tried, but without much success. An American update of H2S, called H2X, was tried, with some results, but not much consistency. Several notable events occurred. The 303rd's *Knockout Dropper* achieved its 50th mission, the first to do so, closely followed by *Hell's Angels* and another nameless bomber with 47 each. In December, the 'jinxed' bomber, *Tinkertoy*, finally met its demise in spectacular fashion, colliding head-on with an enemy fighter.

December saw an intensification of fighting in Russia and in Italy, and several large bomber missions flew against targets in France and Germany. Losses were still high. In fact, on the last two days of the year 48 more bombers were lost. However, even though total losses for the month were nearly as great as those for October, the darkest month of the year for the VIII Bomber Command, these losses were more acceptable in light of the number of sorties flown. Looked at that way, the losses were among the lightest in recent months.

Raids continued over Berlin and other targets. One effective night raid damaged the ball-bearing factory at Erkner, while the next day, bombers attacked 24 flying bomb sights on the French coast, destroying at least seven of them. On Christmas Day, Roosevelt warned, "There is no easy road to victory. And the end is not yet in sight."

Also in December, the Luftwaffe formed a new *staffel* under Major von Kornatzki, whose sole mission was to develop ways to attack the heavies. This unit was the precursor to the infamous *Sturmgruppe*n, which began operations a few months later.

So, as 1943 came to a close, some of the problems of the daylight bomber missions were being solved. With the P-51, new bomber crews and aircraft,

The Sturmgruppen

"The delicate situation of the defense of the Reich in the winter of 1943-44 gave birth to a new kind of fighter arm: The "storm" fighter. It was typical of the spirit of the German fighter pilots that they did not put up with the enemy's superiority, that they did not resign themselves, that they proposed to attack the death-dealing bombers to the point of self-sacrifice. In this way at the end of 1943, in addition to many other suggestions from the front, the following was brought to me: to ram the heavy bombers and in particular the leading aircraft. This idea was undoubtedly inspired by the example of the Japanese kamikaze pilots, who in order to destroy especially important targets dove their aircraft into them. Such self-sacrifice was rooted in the beliefs, the tradition, and the concept of heroism of the Japanese race. We Europeans could marvel at it, but it was foreign to our nature. Therefore I had to reject this idea of self-sacrifice on principle. On the other hand these ideas, whose keenest champion was Major von Kornatzki, gave rise to the formation of special elite units of fighters. Instead of ramming, they were to attack in tight formation as close as possible to the bombers. With more powerful armament they would have a better chance of a kill. Ramming was unnecessary. But it was imperative to wade right in and get as close as possible. The aim was to shoot the heavy bomber down at any price. If during which such a storm attack their own aircraft was heavily hit, they could always ram and bail out." (from **The First and the Last**.)

and extensions on the range of the P-47s, the bombers could look forward to much better escort. So far, though the Luftwaffe had continued to build up its fighter forces, they had refrained from sending them consistently against the bomber streams that had fighter protection, preferring to attack the unescorted bombers. As it happened, the October raid on Schweinfurt was the last major attack deep into German territory that went unescorted—no doubt to the intense relief of the bomber crews themselves.

Still, losses continued, opposition to daylight bombing still persisted, and it was clear that, despite some successes, the build-up of enemy aircraft had not been stopped. Therefore, in his New Year's message, General Arnold formally stated the challenge and the essence of the campaign known as POINTBLANK: "Destroy the enemy air force wherever you find them, in air, on the ground, and in the factories."

Radio Man Vosler

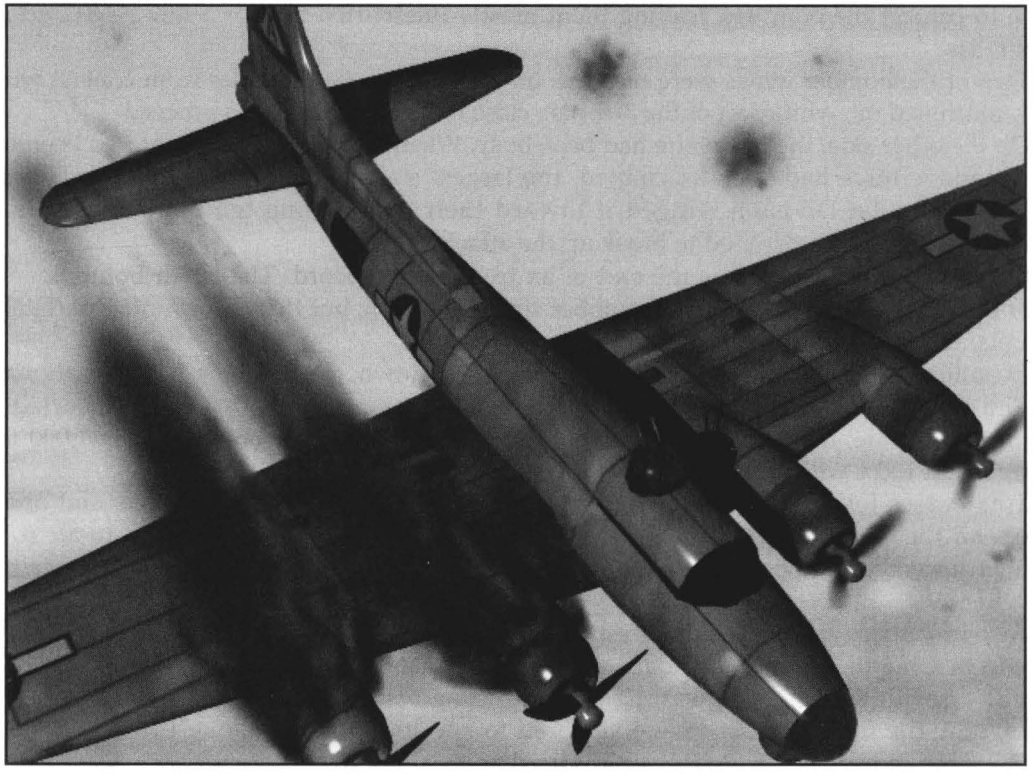
On the same day that the Tinkertoy ended its jinxed existence, another plane with a distinguished history went down. This was the Jersey Bounce Jr. In it, T/Sgt. Forrest Vosler earned a medal for his performance. After receiving flak damage, the Jersey Bounce Jr. had begun to fall behind the rest of its bomber group and was soon in trouble from the enemy fighters that liked to pick on stragglers.

"Vosler, wounded in the thighs and legs by a 20-mm cannon shell exploding in the radio-room, continued to fire his gun at the attackers. Then another shell exploded nearby. Splinters lodged in his chest and face, and both eyes were hit impairing his vision so that he could only distinguish blurred shapes. His face bathed in blood, he declined first aid and cheerfully continued to carry out his duties. The radio had been damaged but between lapses into unconsciousness he managed to repair it, working entirely by touch. When the crippled Fortress had to ditch, Vosler scrambled out onto a wing unaided and held another badly wounded crewman to keep him from falling off until others could help them into a dinghy. Vosler's wounds were such that he was discharged from the Service after ten months in hospitals."

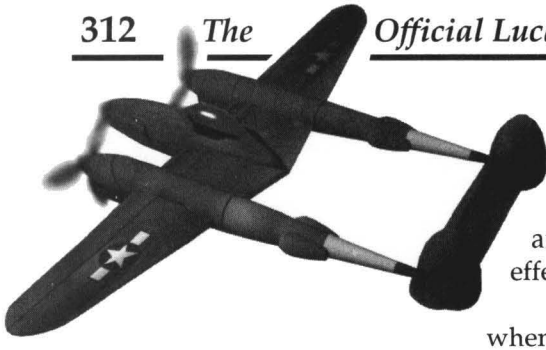
Goebbels' diary (late November): "...the troops' morale has sunk, physically and spiritually, because of our continuous retreats."

Major Cities and
Airforce Headquarters
Glasgow
Belfast
Ireland
Dublin
Great
Britain
Liverpool
Grafton
Underwood
Coventry
Eighth
Air Force
Ninth
Air Force
High
Wycombe
Bushey
Hall
Dover
North
Sea
Netherlands
Brussels
Deelen
1. Jagddivision
Headquarters
Essen
Lille
Belgium
Cologne
Sottevast
Abbeville
Périer
Caen
Falaise
Brest
Paris
St. Nazaire
France
Luxembourg
Frankfurt
Metz
3. Jagddivision
Headquarters
Freiburg
Berne
Zurich
Switzerland
Vichy
France
Lyon
Marseille
Toulon
Mediterranean
Sea
Spain
Barcelona
Corsica
Denmark
Kiel
Hamburg
2. Jagddivision
Headquarters
Magdeburg
Copenhagen
Sweden
Stettin
Danzig
Baltic
Sea
Berlin
4. Jagddivision
Headquarters
Luftflotte Reich
Dresden
Prague
Czechoslovakia
Linz
Vienna
Austria
Schleissheim
5. Jagddivision
Headquarters
Milan
Turin
Genoa
Italy
Rome
Anzio
Foggia
Fifteenth
Air Force
Budapest
Hungary
Zagreb
Yugoslavia
Timisoara
Belgrade
Albania
Tiranë
Warsaw
Poland
East
Prussia
Riga
Latvia
Lithuania
Soviet
Union
Area of Detail
Romania
Ploesti
Bucharest
Bulgaria
Sofia

Chapter 19
1944



On November 1, 1943, the Fifteenth Air Force was activated. The 15th was designed to give another front to the bomber attack by being based in Italy and North Africa. It was thought that this additional location would help divide the German defenses, allow penetration to areas of Germany out of reach of the English-based groups, and that the weather would be more favorable. Very little of this came to be true, but the immediate result was that some allocations of aircraft and crew were diverted from the Eighth to the Fifteenth.



Despite some drain on their replacements, the Eighth Air Force continued to grow during the winter months. For the first two months of 1944, most missions were performed under instrument guidance, and though the heavy cloud cover made bombing less effective, it also limited the role the Luftwaffe could play.

One major exception occurred on January 11, 1944 when a maximum force of 650 heavies set off to attack five separate aircraft plants. Two major targets were the Focke Wulf factory at Oschersleben and the Junkers plant at Halberstadt. The weathermen had predicted clear weather for this mission, an extreme rarity for the winter of '43-'44. However, as often happened, the weather worsened, and with thick clouds and winds above 24,000 feet, most of the anticipated fighter escort was unable to contact the bombers, leaving them mostly unescorted but for a few P-38s and a few dozen P-51s.

Two of the bomber wings were recalled, but the 1st, barely 100 miles from contact with the target, continued on, while part of the 3rd, also close to its goal, elected to proceed.

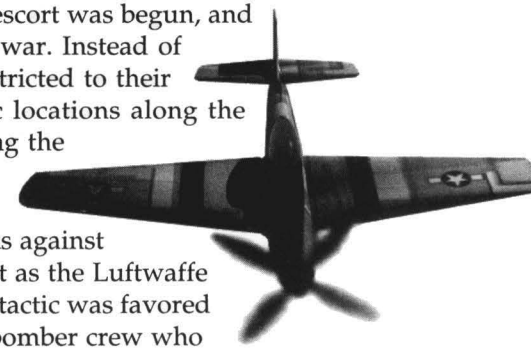
On the other side, the Luftwaffe had been busy. Weather over the continent had been better, and a massive force had been assembled, the largest since October. Into this maelstrom the bombers of the 1st Division winged it toward their goal, losing ten bombers while their outnumbered fighter escort tried to break up the attacks.

One noteworthy event was the end of an exceptional record. The 509th Bomb Squadron, part of the 351st Group, hadn't lost a bomber since June 13th, but this day counted in the loss of seven planes from the group.

Despite the furious attacks in which 34 Forts went down, the bombing was exceptional and caused a great deal of damage. Elsewhere, the 3rd Division groups that hadn't aborted were even more accurate, the 94th Group actually dropping 74% of their bombs within 1,000 feet of the target and 100% within 2,000 feet.

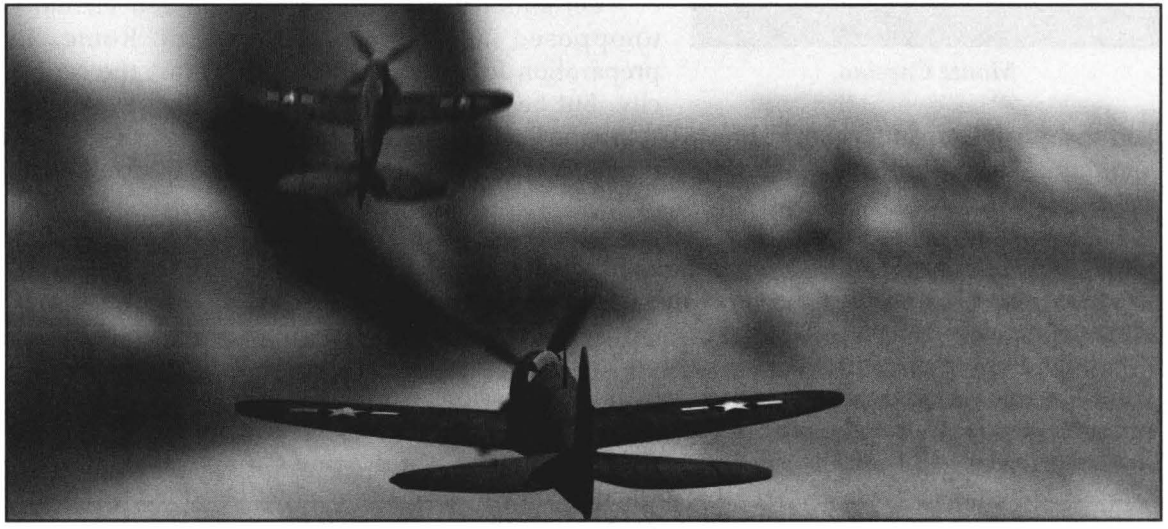
Total losses for the day amounted to 60 heavy bombers for the Americans and about 39 fighters on the German side. Among the innovations witnessed were ground-to-air rockets, which left incendiary devices floating on parachutes, and a cable-borne explosive charge trailed from a Ju 88.

Also in January a new system for establishing fighter escort was begun, and it was to become the de facto standard for the rest of the war. Instead of flying along with the bombers, wasting fuel and being restricted to their speeds, now the fighter groups were vectored to specific locations along the path. Experienced groups of P-47s would guard areas along the bombers' paths closer in while the P-51s and P-38s would provide escort near the target. And the new commander, General Doolittle, favored letting the fighters initiate attacks against the Luftwaffe, freeing them from the tight escort duties just as the Luftwaffe had done earlier in the war with considerable success. This tactic was favored by the fighter pilots, but caused consternation among the bomber crew who preferred the reassuring presence of the "little friends" as close as possible.



About this time also, the fighters began to perform raids on airfields, strafing the German planes on the ground. This led to controversial new numbers in the scoring race as some felt that planes destroyed on the ground should not be counted equally with those destroyed in the air. However, most counts of a squadron or group's score included planes destroyed on the ground and this sort of activity became a favorite occupation of pilots on the way back to base after an escort mission. The combination of ground and air attacks on the Luftwaffe was eventually to contribute significantly to the sought-after goal of giving the Allies control of the air over Europe.

However, there were new dangers involved in such ground strafing as it made the planes vulnerable to ground fire. One such incident claimed Major Walter Beckham, then the leading ace of the VIII Fighter Command. His plane was shot during a strafing run and he was forced to bail out, becoming a POW.

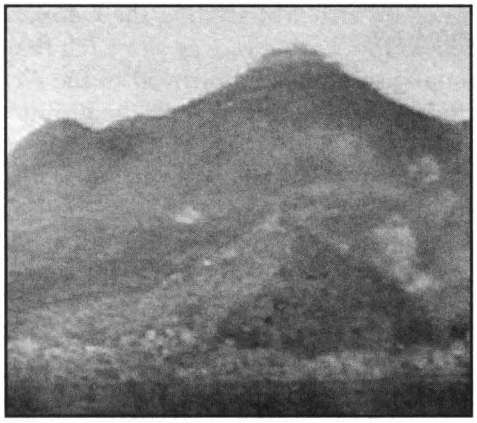


ELSEWHERE...

Along the Eastern Front, the Germans began to retreat at the beginning of 1944, taking a beating and giving ground in order to shore up their western borders against the expected Allied invasions. Of course, the newspapers of the day knew nothing of the German plans and rejoiced as the Red Army advanced to within a few miles of Poland. However, the Allied command knew from their Enigma decryptions just what the Nazis were up to.

In the meantime, the British night bombing missions continued to unload on Berlin, but the rate of attrition was becoming unsupportable as the German night defenses improved. Now, when a raid for Berlin was announced, there was consternation among the pilots and crew.

Hitler was becoming increasingly concerned with the cross-Channel invasion, and had begun to pin his hopes on his secret weapons. In a conversation with Albert Speer and Field Marshal Milch on January 4, he stated, "If I get the jets in time, I can fight off the invasion with them." A few days later, he remarked optimistically, "If I get a few hundred of them to the front line, it will exorcise the specter of invasion for all time."



Monte Cassino.

On January 12, Allied forces attempted to drive the Germans from the area of Monte Cassino, a milestone on the path to Rome. Their attack was repulsed by the German defenders however. That night American bombers attacked and severely damaged aircraft factories in Germany, but suffered the loss of 60 bombers out of 650 involved.

On January 15, the Red Army finally succeeded in driving the Germans from Leningrad and its surrounding area. In the course of the fighting an estimated 60,000 German soldiers were killed.

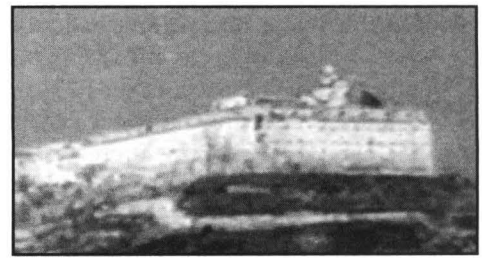
On January 22, Allied troops landed virtually unopposed at Anzio, southeast of Rome, in preparation for another offensive against the capital city. But because of failures in the Allied leadership and the quick German response, the 36,000 troops landed at Anzio were unable to advance far, and the Germans wasted little time in counter-attacking both on land and by air on the following days.

Meanwhile, Hitler told the Japanese ambassador of his plans to reinforce the West. These plans, which included specific troop movements, were then sent by top secret means to Japan. As usual, however, the Allies intercepted this information and were able to use the information to their advantage.

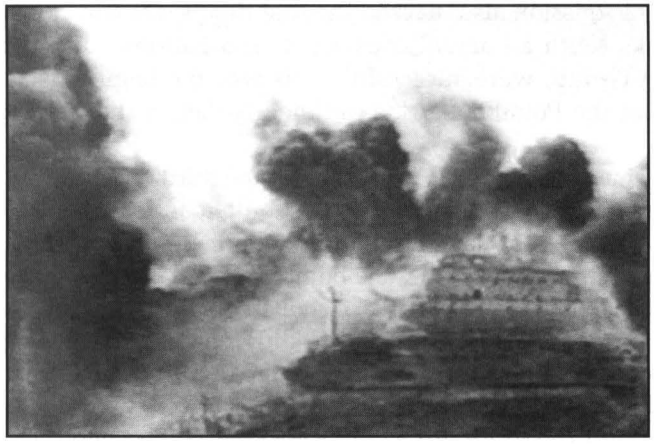
In addition to the information obtained from the Japanese transmissions, the code-breakers were hard at work monitoring the German transmissions for evidence that the deceptions implemented to throw the enemy off the track of the coming invasion were working. Two fictitious forces had been invented. One, the First United States Army Group commanded by General Patton, was given an extensive history and the mission of invading Pas de Calais. There was also a British Twelfth Army that was equally imaginary. Allied intelligence managed to leak plans for invasions in seven different areas, ranging from Norway to Greece, with locations in various parts of France, but the main focus of misinformation was the Pas de Calais.

In early February, the Russians began retaking Polish territory, setting up a potential conflict between the Anglo-American faction which backed a Polish government in exile and didn't want to see a communist-dominated Poland, and the Soviets, who had set up their own government to support.

In Italy, the forces at Anzio were now cut off from the main Allied troops which were still attempting to get by Cassino and move toward Rome. In mid-February, the commanders thought that the monastery at Cassino was being used by the Germans. They decided that it would have to be shelled. Until that point, the Allies had attempted to spare the monastery. However, now they dropped leaflets over the area



The monastery at Cassino.



Bombing the monastery.

warning the "Italian friends" that the monastery would be shelled. "The time has come when we must train our guns on the monastery itself. We give you warning so that you may save yourselves. We warn you urgently: Leave the monastery. Leave it at once. Respect this warning. It is for your benefit." So read the leaflet. Three days later the monastery was bombed and reduced to rubble, killing the bishop and more than two hundred civilians who had not heeded the warnings. Despite the bombing, an attack on the German lines was once again repulsed. Though the Germans had not been using the monastery, they now moved into the rubble and used it effectively for cover.

The next day, the Anzio forces were attacked by a massive German assault, but, forewarned by Enigma, they were able to hold their ground.

Preddy's Ordeal

One of the pilots who went down on January 29 was Captain George Preddy, who was later to become one of the most celebrated fighter aces of the war. On this day, his P-47 was hit by flak, forcing him to bail out over the Channel. Two of his fighter group circled his position until an amphibious RAF rescue craft arrived. But in the rough seas, the rescue craft itself developed trouble and Preddy was forced to bounce around in rough water for four hours until a rescue launch arrived.

Preddy's first plane.

This was the second time Preddy had been forced to bail out of a plane, the first occurring when he had been stationed in Australia during flight practice. As Preddy played the part of a bomber, his mates were pretending to attack him, but one pilot misjudged his approach and sheared off Preddy's tail. Although Preddy escaped with a few fractures, the other pilot was killed.

BIG WEEK: FEB. 19—FEB. 25

On February 20th, on the expectation of good weather, more than a thousand bombers were sent to various locations in Germany. Bombing was generally good, though the weather was not quite

up to expectations, and losses were low. This mission also marked the first time P-47s had flown with the new 150 gallon metal drop tanks (with an actual capacity of 165 gallons), and the fighters, especially from the leading 56th Group, were successful. This was the beginning of Operation Argument, an implementation of the Pointblank plan outlined earlier in the year. It was also called "Big Week."

The same satisfactory results were obtained the next day, and then, for the third day running, bombers were sent out. However, on January 22nd the weather was worse than anticipated, and losses were heavier while most bombing had to be done using pathfinders or by finding other targets of opportunity. Several misfortunes occurred, including one bomb dropped on an English airfield by mistake, and another dropped on a Dutch city, causing 850 civilian casualties.

On the 24th, more than 800 bombers were assembled and sent to different targets. Among those hit were Schweinfurt (again) where further damage was done to the ball-bearing factories, in addition to factories making jam, gelatin, and malt. Though some of the bomber streams met with light resistance, others were hit hard and the losses for the day totalled 49. Despite these losses, another 830 Fortresses and Liberators were in the air on the 25th and achieved excellent bombing results at Regensburg and Augsburg in particular with the loss of 31 bombers.

FEB. 24 MISSIONS

P-51B MISSION 3

P51B Escort B-17s to Regensburg

Big Week saw the Eighth Air Force concentrate its forces on the destruction of the German fighter aircraft industry. From Feb. 19-25, 1944, the bombers of the Eighth flew 3,300 sorties and unloaded 6,000 tons of bombs. The combined efforts of the USAAF and the RAF Bomber Command during this week dealt a devastating blow to Luftwaffe fighter production. However, the German dispersal program, put into practice after the heavy raids in the summer of 1943, helped to nullify the effects of the damage somewhat. The Germans had also become quite adept at salvaging machinery from the wreckage of their demolished factories.

Your Mission

Flying with the 357th Fighter Group, you are providing close escort to B-17s of the Third Division en route to the Messerschmitt factory at Regensburg. You've been briefed to expect an air defense of many single-engine fighters.

Strategy

You'll find yourself quickly out-numbered in this mission, as wave upon wave of Bf 109s and FW 190s attack you and the bombers. The best defensive position is out in front of the bombers. This will allow you to take on the enemy fighters taking a head-on approach at the bombers.

"Early on, we would look for what we called the 'Abbeyville Kids.' They were all yellow-nosed... they had to have twenty victories to belong. Well, I tangled with one, one day. He and I were both doing everything we knew, and it was right on the treetops. Ultimately we ended up in a tight circle; he was on one side and I was on the other. If he rolls out, I've got him. If I roll out, he's got me. So it's who's going to outlast who, and I had plenty of gas. So one of the things we could do in the '51 was drop ten degrees of flaps which gave us more lift... inotherwords allowed me to turn tighter. So now I'm using the aircraft to its ultimate capability. He's trying to give me the toughest shot I could ever get, so I have to get out here to get enough lead to get him. So I am shooting, literally, looking over the wing root, down where I'm on top of him. The tracers go out; they go out straight, but it looks like they're going like this (describes a tight arc.). Right in the top of the cockpit..." —Maj. Richard Peterson, 357th FG (from **Fighter Aces of World War II**).

FW 190 MISSION 4

Defend an Aircraft Factory

This is the same operation as P-51B Mission 3

Your Mission

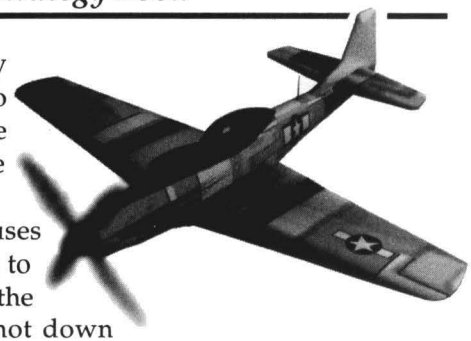
On the fifth and final day of the Allies' "Big Week," one of their targets is the Messerschmitt factory at Regensburg. As a formation of B-17s approaches the target area, you and three other Focke-Wulf 190s are in position to intercept the Americans. The three Bf 109s flying with you will attack the Mustang escorts.

Strategy

Follow the planes in front of you to the bombers. The Bf 109s flying with you will attack the Mustang escorts. Because of the sheer number of bombers, you'll have to maximize the use of your guns. Attack the outer edge of the bomber formation first. Go to the map and assign the other FW 190s specific bomber targets so that you don't duplicate the efforts of your wingmen. Remember that there is safety numbers. Try to attack the bombers with the other FW 190s at the same time.

LOOKING BACK AT BIG WEEK

In retrospect, the week of February 19-25 was the busiest of the war so far for the VIII Bomber Command, and it looked to be a successful one. However, despite the fact that German fighter production was slowed down after this effort, their dispersal of essential industries had softened



the blow. In addition, the relatively small bombs carried by the American bombers were not powerful enough to destroy many of the critical machine parts, which could be dug up again and reused. It was easier to reconstruct the buildings than it was to retool the machine parts.

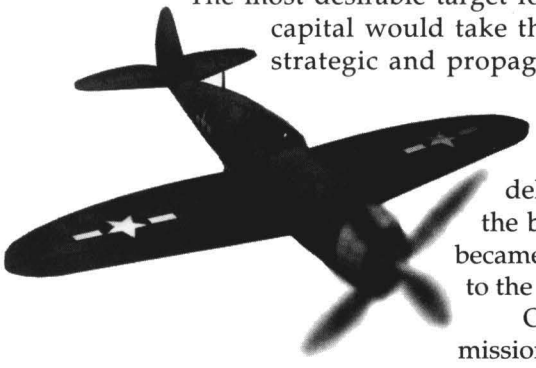
In all, the Americans lost 400 bombers from all causes during the week, but the VIII Fighter Command was able to claim a three to one advantage over the Luftwaffe. During the month of February, they claimed 287 enemy fighters shot down against only 85 fighters lost. As many as 208 of those victories occurred during Big Week. Many more German aircraft were destroyed on the ground by bombs.

Also notable during the end of February and the beginning of March, the 4th Group, now under the experienced guidance of Don Blakeslee, finally got the P-51 Mustangs they had been wanting. The rivalry between them and the leading 56th was more than a little intense, and the arrival of the P-51s was a signal to heat up the competition all the more since the 56th pilots swore by the Thunderbolt, and the 4th, with its traditions steeped in the old RAF outfit and the Spitfire, were ready to fly the P-51 with its familiar Merlin engine.

On February 28, the test pilot Hanna Reitsch was receiving the Iron Cross, First Class from Hitler when she suggested a new way to combat the Allied air bombardment. Her idea was the formation of suicide squads who would pilot flying bombs. Although Hitler rejected the idea at first, he later allowed Reitsch to develop it. When the group was finally formed, Hanna Reitsch was the first to sign the pledge: "I hereby voluntarily apply to be enrolled in the suicide group as a pilot of a human glider-bomb. I fully understand that employment in this capacity will entail my own death." One wonders about the starting salary for such a position. It's clear that there was little room for advancement.

On March 2nd the Kommodore of J.G. 2, Egon Mayer—known as "the Fortress Specialist"—was shot down. He had 103 victories to his credit.

BANGING THE BIG B



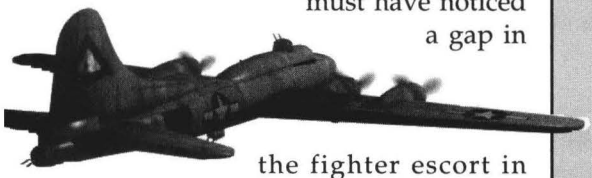
The most desirable target for the Americans was Berlin itself. Bombing Hitler's capital would take the war home to the Germans and would have both strategic and propaganda value. This had been a target of choice since November, 1943, but the opportunity to mount a big mission against it wasn't found until March 3rd. Weather hampered the attempted launch and it was delayed until the 4th although a few P-38s, unaware that the bombers had been recalled, made it to Berlin and thus became the first American planes to fly over that city, much to the delight of the press and propagandists.

On the 4th, weather again forced the cancellation of the mission, but two squadrons from the 95th and one from the

100th failed to receive the return order. They continued on, and the commanders allowed some escort to accompany them. Meeting with light resistance, the small force of 31 bombers made it to Berlin, where occasional patches of clear sky let them sight on Berlin, but their bombs were dropped through cloud. On the way back from Germany, they received more attention from the Luftwaffe, losing five bombers; but the propaganda and morale value of this little raid far exceeded any other factor.

March 6, 1944

The small March 4th incursion into the all-important city of Berlin only set the stage for what was to occur next. On March 6, 1944, 730 bombers successfully took off on a direct route to Berlin. The Luftwaffe was ready for them this time, and began its attacks over Dummer Lake, concentrating first on the lead wings. But a ground controller must have noticed a gap in



the fighter escort in the 60-mile long bomber formation, and fighters were vectored into the unprotected middle of the stream. Ironically, among those hardest hit were the 95th and the 100th, the same two groups that had hit Berlin two days before. Between them, they lost 23 planes, and the 100th's reputation as a jinxed outfit was renewed, earning them the nickname "the Bloody Hundredth."

Aircraft Scoring

When determining the results of an air engagement, there were three important statistics.

- The most important was the number of confirmed "kills." Confirmation was often obtained by means of gun camera footage, or by the observation of another pilot. The rules for allowing a "kill" varied from one air force to another. In some, it was enough that the pilot claimed the victory. In others, independent confirmation or camera footage was required.
- The second important statistic was the number of "probables"—aircraft that were probably shot down because they had taken significant damage, but confirmation was unavailable.
- The third statistic was "damaged"—aircraft that had taken hits but not been shot down. The way to notate these statistics was as three numbers. For instance, if a squadron shot down nine aircraft, had probably shot down another three, and had damaged six more, the score would read 9-3-6.

Many of the bombers never encountered opposition, but where the fighters attacked, there were many losses. This day accounted for 69 missing B-17s and B-24s, a record loss, and with fighters downed, the Americans lost 80 planes in all. The German losses were also high, though claims of 93-44-66 by the bomber crew had to be suspect. But the claims of 82-9-32 by the fighters were better supported. The bombing for the day, which had to penetrate thick cloud, was largely ineffective.

Blakeslee's 4th were highly successful that day, with 15 recorded kills, but the surprise of the day was the success of a new group, the 357th, in operation now for less than a month.

Having lost 15 of its planes to early mechanical problems, it arrived over Berlin to find the bombers of the 3rd Division under attack by more than 100 enemy fighters. With only 40 plus P-51s, the"rookie" pilots not only routed the enemy fighters, but, with some ground strafing along the way back, accumulated an incredible 20 kills and 8 probables with not a single loss! Of the 82 claims for the day, 45 were attributed to the P-51. The Mustang was proving its worth.

MARCH 6 MISSIONS

P-47 MISSION 5

Fly with S. Johnson

Lt. Robert S. Johnson became the second highest scoring aerial ace of the Eighth Air Force while flying the P-47 Thunderbolt. On March 6, 1944, Johnson was leading the 61st Fighter Squadron as they provided escort for the First Air Task Force of B-17s during the first leg of the bombers raid on Berlin.

The rear combat wing of the B-17s was attacked by approximately 100 enemy aircraft, primarily Bf 109s and FW 190s. The 61st called for help, but no one was able to reach them during the combat. They were forced to defend the bombers on their own.

Your Mission

Put yourself in Robert Johnson's place as you and your wingman attempt to defend a formation of B-17s from attack by numerous waves of enemy fighters.

Strategy

Attacking the FW 190s is the priority in this mission. If the Bf 109s are hot on your tail, then break off and deal with them as they attack you. Once all the enemy fighters have been shot down, then make your way back to your home airfield.

P-51B MISSION 4

P-51B 4. Escort B-17s to Berlin

On March 6, 1944 the Eighth Air Force successfully launched its first large scale raid on the Reich's capital. Berlin had been the objective on several occasions before, but adverse weather caused each of these attempts to be scrubbed. 730 heavy bombers assembled in the skies over East Anglia and proceeded east. The bombers were escorted by 796 fighters in anticipation of heavy German fighter defenses.

The primary targets for this day's raids were aircraft factories, engine factories, armament industries, as well as the Erkner bearing plant in Berlin. As expected, intense fighter opposition was encountered from the area over Dummer Lake all the way to Berlin. Dense flak defenses were also present from all sides of the city as the bombers neared their various targets.

Your Mission

You and your wingman are providing fighter escort for a formation of B-17s on their final leg to the target: the Berlin ball bearing plant. Your P-51Bs are capable, long range escorts, but you'll undoubtedly have your hands full when the German interceptors appear. Protect your bombers as they approach and bomb their target, then escort them back to England.

Strategy

All the enemy fighters in this mission have orders to attack the bombers and will evade rather than engage you. There are lots of waves of both Bf 109s and FW 190s. Expect a group of FW 190s to appear just as the bombers reach the target. Many of the enemy fighters are equipped with rockets so you'll have to work quickly to eliminate the threat. In order to succeed in this mission, you'll need to have good deflection shooting skills.

B-17 MISSION 2

First Raid on Berlin

This is the same operation as P-51B Mission 4.

Your Mission

You are part of a formation of 6 B-17s bound for Berlin. Your target is the Berlin ball bearing plant. In order to skirt the flak batteries around Berlin, you are flying a pattern that takes you south of the city. Watch your flight leader to know when to turn north for your approach to the target. Although your group has P-51 fighter escorts, aggressive enemy fighter resistance is expected.

Strategy

Make sure you maintain a tight formation with the other bombers all the way to the target. Watch your flight leader and make the turn when he does. The other bombers will follow. If your flight leader gets shot down then, you become the flight leader. Refer to the map

The Miraculous Escape of 1/Lt. John C. Morgan

Flying in the lead group of the March 6th raid, in a bomber equipped with the latest H2X radar, 1/Lt. John C. Morgan was already a veteran of the battles, having won the Medal of Honor in July for his heroic one-handed ordeal in the cockpit of a Fortress. This time, he had no chance to save the plane as an explosion took the cockpit apart, killing 8 of the 12 crewmen. But Morgan was one who survived, in dramatic fashion.

"I was just conscious of something terrific happening and I had a faint idea of a lot of metal tearing at me and then I was falling. I don't think I ever lost consciousness. I had my 'chute under my arm when we blew. I kept trying to get it on. When I was falling feet first the pressure kept pushing it up too high, and when I was falling head first it kept pushing it past my chest. I guess I was on my back when I finally got it fastened on. . . I think you think clearer when you're so damned near dead. Three or four seconds after the 'chute popped open I landed in the top of a tree. I fell out of it—about 30 ft—and landed on my feet. I felt like I'd busted every bone in me. What a jolt!" (from **The Mighty Eighth**.)

often and make sure you turn when you reach way point one. Use your gunner positions to cover the bombers. Once you're over the target, the enemy fighters will attack with rockets. Shoot early to help drive them off.

BF 109 MISSION 4

Intercept Raid on Berlin

This is the same operation as P-51B Mission 4.

Your Mission

Your mixed flight of Bf 109s and FW 190s has been vectored to intercept a formation of B-17s. The bombers are dangerously close to their bomb release point over the Erkner bearing plant. You and your wingman are to intercept the escort fighters, while the Focke Wulfs will attack the B-17s. If the 190s are not successful in shooting down all of the bombers, you may have to attack them yourself.

Strategy

Two pairs of P-51Bs protect the bomber group. Pick one pair of P-51s and stick with them and attack. Once the pair has been destroyed, move on to the next pair. If the FW 190s haven't destroyed all the bombers go after them.

FW190 MISSION 6

Intercept Raid on Berlin

This is the same operation as P-51B Mission 4.

Your Mission

Follow your leader in an attack on a formation of B-17s. The bombers are on the final leg of their flight to the target, the Erkner bearing plant in Berlin. Although your primary objective is to prevent the bombers from reaching their target, you'll have to deal with P-51 escort fighters as well. Your flight of FW 190s is armed with air-to-air rockets.

Strategy

In this mission you'll find three groups of three bombers and two P-51s as escorts. Concentrate on the bombers, but be aware of the location of the P-51s. Use your machine guns from a distance to soften up your target. Take your time, and make each shot count. Make sure you don't fly your plane between the bombers where you'll get chopped up in a crossfire.

THE BEAT GOES ON

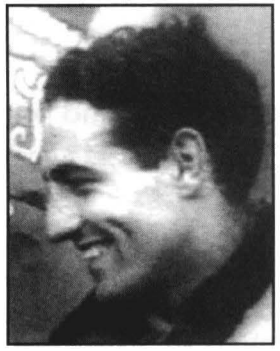
By March 8th, the American bombers were off to Berlin again as the city was under relatively clear weather and the opportunity for a visual bombing raid was a clear invitation. Despite some errant bomber groups, enough of the bombers got through to make some 75 direct hits on the Erkner bearing plant, the original target of the March 6th raid. And, although 37 bombers were missing at the end of the day, the luckless 100th only lost one which had to leave the formation with engine problems. Fighters claimed 79 more Luftwaffe planes, and, though they lost 5 planes in an ambush, the pilots of the 56th were able to claim 27 more. Many of their claims were obtained by waiting near the German air bases and shooting the returning planes down.

On the 9th, more bombers flew over the Big B, but heavy cloud made them bomb on radar only. Nine Forts were lost to flak.

As the weather worsened, deep sorties into Germany became less practical, and again the bombers were sent against the NOBALL targets (the V weapons sites along the coast of France). For the rest of March, there were several raids on targets inside Germany, with mixed results, and on the 22nd another huge force bombed Berlin again. By now, more radar equipment had been installed in the planes, and a greater proportion of incendiary bombs were being used, including the new M-76 known as the "block burner."

In the rivalry for top honors, the 4th, with their Mustangs, began to mount a challenge against the leading 56th. Between the 18th and the end of March, they were to accumulate 100 more victories against only 10 for the 56th. Falling to their guns was one of the German aces, Oberst Wilcke, with 162 victories.

On April 1, the 4th reached 300 victories, and their leading ace, Don Gentile, went ahead of the current leading ace from the 56th, Robert Johnson.



Don Gentile.

ELSEWHERE...

The Red Army continued to drive the Germans backward, but in Italy the German defense was phenomenal. On March 15, the Allies dropped more than a thousand tons of bombs on the area of Cassino and followed it with 195,000 rounds of artillery. Despite this massive attack on a tiny area, the German defenders stood fast in the brutal fighting and once again beat back the Allied soldiers.

"We had able instructors; they worked for the German Air Force."
—Capt. William O'Brien, 357th FG

At the end of March, General Doolittle summed up the situation. "Our immediate goal is the destruction or neutralization of the German Air Force, the one factor which might have defeated our purpose had it been permitted to develop and expand according to known German plans. In most of our recent operations, the German fighters have shown little inclination to come up and fight, an indication that their losses are now exceeding their replacements and that they are conserving their forces."

Doolittle's speech was at least partly correct. Actually, the Luftwaffe's equipment needs were still being met as their dispersed industry was actually assembling planes in small buildings and even caves around the Reich. However, where they were hurting badly was in the personnel area. Replacements of airplanes were no good without skilled pilots to fly them. Shortages of fuel meant skimping on training and incomplete training meant unskilled and vulnerable pilots to man the planes. In fact, this may also have helped explain the increasing success of the American fighters as their opposition became increasingly less experienced. The average American fighter pilot received 120 hours of flight training. The average new German pilot only received about 27 hours before becoming operational. Also, many (though not all) of the American pilots were able to ease into combat by flying the milk runs into France and nearby targets before mixing it up in serious battles with the Luftwaffe. For the new German pilots, there were no easy missions. The attrition rate of Luftwaffe pilots at this point in the war was as much as 25% per month!

Another factor in the Americans' favor was the rate of fire and destructive potential of their machines. Their six to eight .50 caliber machine-guns, could deliver more rounds in a short time than their opponents, and the muzzle velocity was greater as well. For instance, in a one-second burst, a P-47 delivered 100 rounds; a P-51, 80; the FW 190 delivered 60 rounds while the Bf 109

only could fire 30. The cannon on the German planes were good for shooting down bombers, but not as effective against other fighters.

Other technical improvements were to come later in the year, adding further to the American pilots' superiority. One was the G-suit which let them perform more radical flying maneuvers without blacking out. The other, introduced in late summer of 1944, was the K-14 Gyroscopic Gunsight, known to the pilots as "No Miss Um." This sight, at first a complicated device, became the pilot's standby as it made the chances of successful deflection shooting, even at a 90 degree angle, much greater.

APRIL 1944

For the first part of April, missions were sent to many parts of Germany as well as to locations around France. Some of the missions were sent against the V weapons sites, where increasing resistance was encountered in the form of flak batteries. Others were beginning to be sent to soften up the transportation networks in preparation for the planned invasion. In some of these missions, fighters were sent to strafe locomotives, barges, flak towers, factories, oil storage facilities, and Luftwaffe airfields. Although this was an effective form of attack, it could be costly. Early in April, in a matter of days, four of the top scoring aces were shot down—several by ground fire. Still, the strafing missions did destroy many of the Luftwaffe's planes on the ground, and more in the air.

More and more strafing missions were being mounted, using the guidelines created during the experimental sorties by Bill's Buzz Boys. Basically, the fighter groups were given specific areas with which to familiarize themselves. They had to know the area extremely well. By dividing the landscape up, there was no danger that one group would attack a target that had

Bill's Buzz Boys

During March, as ground strafing became increasingly common, Colonel Glenn Duncan, after losing Beckham, decided it was time to create a unit of ground specialists. With General William Kepner's permission, he rounded up volunteers from various squadrons and they set about developing tactics. The new squadron was nicknamed "Bill's Buzz Boys" after the General.

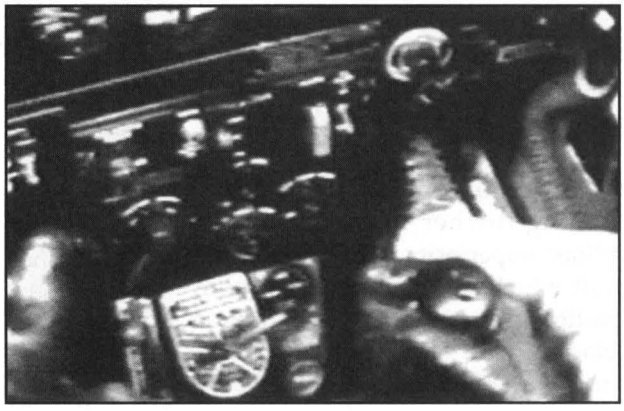
Eventually they decided the best way to carry out the ground strafing missions was to dive from cruising altitude of about 15,000 feet to treetop level and skim the countryside for five miles flying line abreast. Without warning, they would fly over the target and destroy all that they could, staying low until well clear of any potential ground fire.

In order to carry out this dangerous high-speed mission, it was necessary to know all about the intended target area—gun emplacements, local landmarks, and certainly anything that might obstruct the flight path. Also, only one attack in a given area would be performed so as not to alert the ground defenses.

After less than a month of operations, the special unit was disbanded. Their success was sufficient that larger scale operations were planned. In six raids, they had destroyed 14 enemy aircraft and shot up 36 trains while losing only three P-47s, one in a collision with a house.

At the same time, experiments were being conducted using the P-47 as a dive bomber, with some encouraging results.

already been attacked by another and might be on alert. The biggest advantage the strafing fighters had was surprise. The biggest danger was an alerted ground defense. Therefore, each target would be hit only once on a particular mission. A second attack would meet deadly resistance in many cases.

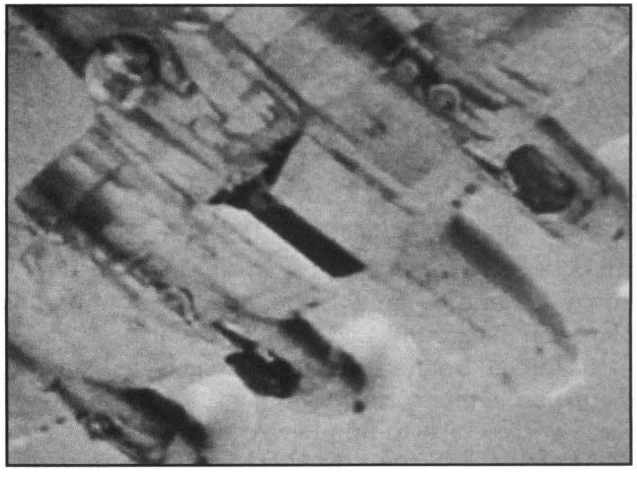


In the cockpit of a P-51.

The Luftwaffe's losses continued to mount in the air as well. On April 8th, the American fighters claimed an incredible 128 planes destroyed—88 in the air and 40 more on the ground. The 4th Group, quickly becoming the top scoring group with their Mustangs, scored 31 kills for only four losses in dogfights against a superior force of Bf 109s. Every day, when the Germans mounted a resistance, they were sustaining more losses.

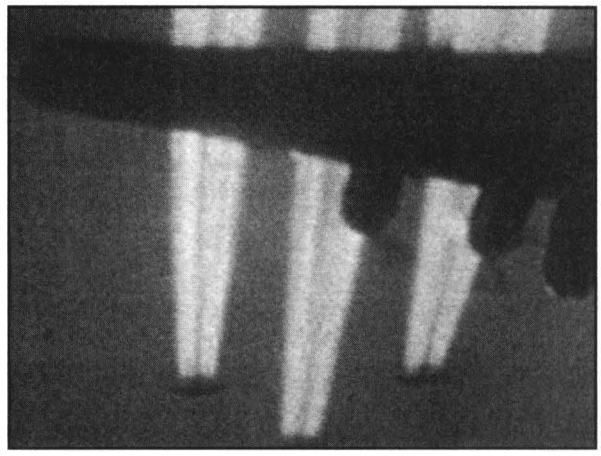
Also on April 8, the Red Army launched its offensive against the Germans in the Crimea, the last major Russian territory held by the Nazis. Within two days, the German lines had been routed and the Russians took control of most of the area. Also on April 8, British and American planes began dropping mines into the river Danube near Belgrade in an effort to hamper the supply route from the oil wells at Ploesti to the German refineries.

On April 11, a very precise Mosquito bombing raid attacked a five-story building in The Hague, flying at only fifty feet and destroying the index card system used by the Gestapo to track down the Dutch partisans and resistance fighters. Though many Dutch officials were killed in the raid as well, many more lives were saved by the mission.



Despite their growing losses, the Luftwaffe was still able to send up huge fighter forces, but only when they could pick their spots. For instance, in a raid on Berlin on April 18th, almost no opposition was met, except by one unfortunate combat wing, which had become separated from the rest, and from their fighter cover. The German ground controllers were always watching for unescorted bomber groups, and vectored a substantial number of FW 190s toward this lone wing. Led by the

ace Major Friedrich Muller, credited with 130 victories, the J.G. 3 was reported to have shot down 31 bombers, though they probably only shot down 8. Total claims for the day by the Germans were 43, but only 19 were missing.



The Germans had certainly begun to take the American bombing threat seriously. One indication of this was that they were now sending small raids out to bomb the airfields in Britain, and, on the 22nd, they sent a force of Me 410s to follow the returning bombers. As the bombers attempted to land, the Messerschmitts attacked. In all, they hit several airfields, dropping bombs and shooting down several heavies. In the confusion, more bombers were shot down by friendly fire.

Meanwhile, on Hitler's 55th birthday, April 20, Turkey announced that they would no longer supply chrome to Germany. The chrome was an essential component in the production of high-grade steel, and Germany's reserves would not last more than a year or a year and a half. Also, the decoding of a top secret message detailing General Guderian's plans to inspect the tank forces in Western Europe allowed the British a very good idea of the deployment of tanks only months before the Normandy invasion was to take place.

On April 24th, another 750 bombers took off and attacked targets in the Munich area. Again, where the fighter escort was present, the Germans either didn't attack or were soundly beaten. However, those groups that flew without escort were, themselves, beaten. For instance, part of the 1st Division was without escort for at least an hour, during which they were set upon by an estimated 200 enemy fighters, suffering terribly.

It was also on this day that 1/Lt. Gordon Clubb had a harrowing experience with a friendly bomb. In taking evasive action to avoid flak that was getting too close, Clubb took his B-17 into the bombing path of another Fort and was hit by two 500 pound bombs. One hit and knocked off parts of his plane, then fell away, but the other hit the wing root and bounced off, becoming embedded in the No. 3 engine. For an hour, Clubb attempted to dislodge the bomb by maneuvering the plane, but it stayed in place. Finally it did fall away, but when the bomber landed in England, it was found that the bomb's fuse was still in the engine! Other planes were not so lucky when hit by bombs. Witness the three pictures on page 35 of the Secret Weapons manual!

Several more large raids were undertaken in April, and where fighter escort was available, the bombers were more or less unmolested by the Luftwaffe. However, the German ground controllers were very good at identifying any unescorted bomber streams. On several days, very high losses were experienced as bombers would go unprotected for a variety of reasons.

April also saw the emergence of the deadly *Sturmgruppe* which had specialized in techniques for shooting down heavy bombers. They would assemble in *gruppe* strength of around 30 planes, then attack head-on, firing at close range and then peeling off. With extra cannons and extra armor for the pilot, these mass attacks were devastating. Only effective

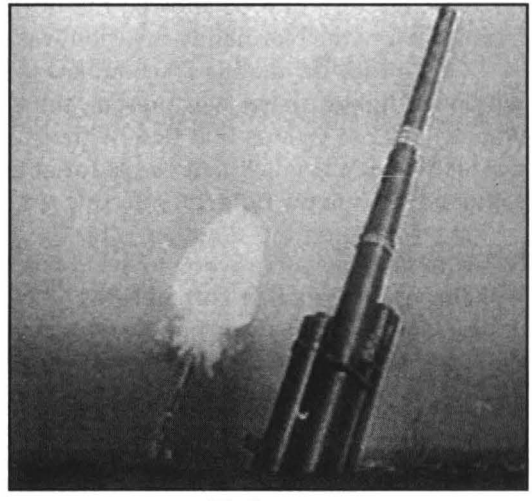
Fortress in flak.

fighter cover could protect the bombers, and often other *gruppe* were assigned to take on the fighters while the *Sturmgruppe* did its work.

New bombing missions were organized using a specially modified version of the P-38 called the Droop Snout, equipped with a Norden sight. Leading a force of fighter/bombers, the Droop Snout craft would signal the bombing and the fighter/bombers, which might be P-47s or other P-38s, would drop on the signal. This was found to be a successful combination for medium bombing missions, especially against the transportation targets and factories closer to the English bases.

In assessment of the month of April, it was found to have produced some new records. In fighter claims against the enemy, 1223-142-763 was by far the highest for a month so far. However, with 512 planes missing and another 65 Category E's (beyond repair), this was a costly month as well. Of the lost planes, 361 were heavy bombers.

Of growing concern at this point was the increasing accuracy of the flak batteries. With improvements in radar-assisted aiming, the Germans had apparently improved their gunnery by a substantial margin. In January only eight bombers had been lost to flak, but in March, 54 had been lost. Then, in April, although flying only about 1,000 more missions than the previous month, the flak score was more than double at 131. Carpet and Window were still being used, but now the new British RCM (Radio Counter Measures) were being added and new adjustments were made to the bomber formations to minimize the damage that a single flak shell could cause. Finally, many bomber crew would take along a piece of armor to sit on, but this was not considered official equipment.

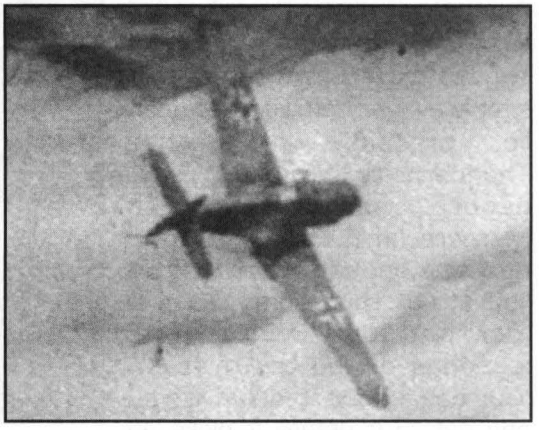


Flak guns.

There was no question that Hitler considered the AA guns his best weapon against the bombers. During 1944, flak weapons comprised 30% of all artillery produced, and there were more than a million people involved in manning or maintaining the flak batteries, mostly in Germany. For the effort expended, the effectiveness of the flak guns was poor, but that would hardly have mattered to the crew of a bomber flying through the stuff.

In spite of the heavy losses sustained in April, they were the result of much heavier operations, and only amounted to about 3.6% of the total sorties flown. In contrast with the October 1943 losses of 9.2%, these were considered acceptable, other than the increase in flak damage.

MAY 1944



A Focke Wulf 190.

The month of May saw many of the available bombers involved in attacks on transportation and NOBALL, CROSSBOW, and CHATTANOOGA (transportation) sites in preparation for D-Day. However, there were several raids into Germany, including the first true 1,000 bomber raid over Berlin on May 7th, a day when visual bombing was feasible. On this day, the German planes were not much in evidence, but the next day, as was the pattern, the Luftwaffe was able to intercept some unescorted bomber groups and destroy a significant number of aircraft. Also on May 8th, the first American fighter pilot to shoot down five enemy craft was 1/Lt. Carl Luksic who got three Bf 109s and two Focke Wulfs. At least 200 German fighters were estimated to have been out harassing the bombers.

MAY MISSIONS (NOBALL)

P-47 MISSION 1

Attack a V-1 Site

During the first week of May, 1944, Allied preparations for D-Day included a sweep of targets considered to be threats to the invasion build-up. These targets were given the code names CROSSBOW or NOBALL. CROSSBOW targets were those suspected of being V-1 launching sites. NOBALL targets were the V-weapon launching and assembling sites, as well as their storage and manufacturing centers.

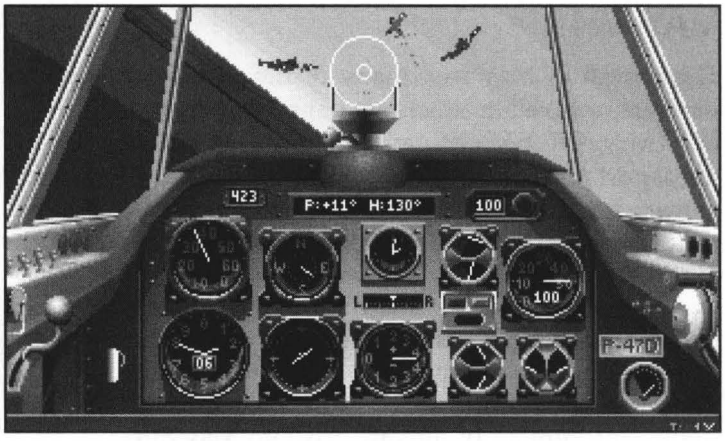
Your Mission

You are to attack the V-1 flying bomb launch site at Calais. You and your wingman will follow the flight leader in to dive-bomb the target. Try to make as many strafing passes as possible after dropping your bombs. You are escorted by a pair of P-51s, but be alert for German interceptors.

Strategy

As you approach the target, protect you leader. You'll need to dogfight the Bf 109s before you reach the target. Another group of Bf 109s and a group of FW 190s will appear once

the action begins. Keep in mind that the other P-47s will not engage the enemy fighters, but simply evade them, so you need to protect the other Thunderbolts, too. Your P-51 escort will attack the Messerschmitts but you will still need to engage them before you attack the target. Keep a look out for a V-1 that is launched during the mission. You can shoot it down if you can get to it before it picks up too much speed.



P-51B MISSION 1

Escort raid on V-1 Site

During the first week of May, 1944, the Allies concentrated on the pre-invasion disruption of railway centers in occupied Europe. The Eighth Air Force was diverted from attacking rail targets in France and Belgium due to bad weather. Instead, they bombed Pas de Calais NOBALL V-1 launching targets.

Your Mission

Flying alone in your Mustang, you are to escort a small formation of B-17s as they bomb a V-1 site. Protect your bombers from enemy fighters, and also intercept any V-1 flying bombs that might be launched in your vicinity.

Strategy

Stick with the bombers and protect them. Make sure you clear the skies of enemy fighters as the bombers make their way to the target. Once the bombers reach the target, keep an eye out for V-1 that's taking off.

B-17 MISSION 1

Bomb V-2 Site.

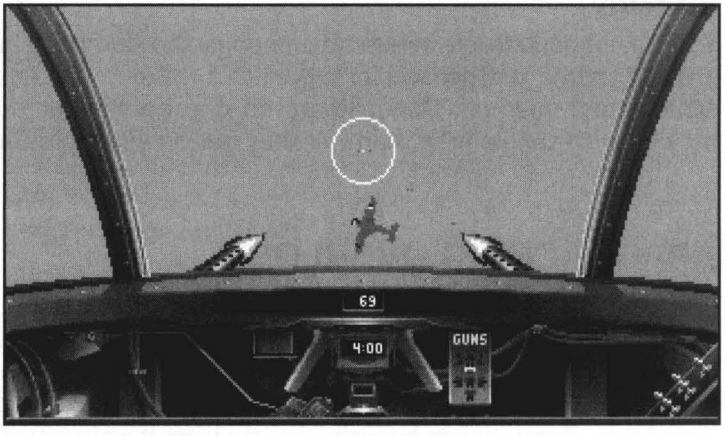
During the first week of May, 1944, the Allies concentrated on the pre-invasion disruption of railway centers in occupied Europe. The Eighth Air Force was diverted from attacking rail targets in France and Belgium due to bad weather. Instead, they bombed Pas de Calais NOBALL targets.

For a more concentrated bombing pattern on the targets, smaller formations of B-17s were used. Squadrons released their bombs on signal from their leader.

Your Mission

Flying in a small formation of B-17s, you are to bomb a V-2 missile site. You'll have a pair of escorts to protect you, but you may have to man your guns before you get to the target. When you reach the target, watch your leader and drop your bomb load when he does.

Strategy



As you make your way to the target, man the ball turret and fire early to ward off the attacking FW 190s that are carrying rockets. Make sure you have the other gunner positions set on auto. Once you see your flight leader drop his bombs, then drop your bombs as well. Use the manual release rather than the auto release for a greater spread of bombs on the ground. Drop one bomb every second. If your flight leader gets shot down then you become the flight leader. Use the bomb sight to find the target on the ground. Once the target is at about a 40-45 degree angle in the bomb sight set the timer to release your bombs automatically and return the ball turret. Just as the bombs hit the ground, keep an eye out for a V-2 that is launched. It is possible to shoot the V-2 down from the ball turret.

BF 109 MISSION 6

B-17s Attack a V-2 Site

During the first week of May, 1944, the Allies concentrated on the pre-invasion disruption of railway centers in occupied Europe. The Eighth Air Force was diverted from attacking rail targets in France and Belgium due to bad weather. Instead, they bombed Pas de Calais NOBALL targets.

Your Mission

Your flight of four Bf 109s and two FW 190s is on patrol over northern France. The ground controller has vectored units in your area to intercept an Allied attack on V-weapon sites in Pas de Calais. You've picked up a formation of B-17s headed south toward the V-2 missile base at Lille. Their escorts appear to be delayed, so your squadron has an opportunity to make a clean attack for a few minutes. Stop the bombers before they reach their target. Each plane in your flight is armed with air-to-air rockets.

Strategy

You have about three minutes to engage the bombers before a pair of P-51s shows up to protect them. The bomber crews in this mission are good. Don't get too close! Make fast attacks and veer off. Concentrate on one bomber at a time. Once the P-51s arrive, you may have to tangle with them—if they get on your tail. Save your rockets for the bombers.

APPROACHING OVERLORD

Living or dying seemed often to be a matter of luck. Take for instance, the example of a ball-turret gunner in the Liberator Valkyrie. Too badly damaged to try a landing after its May 8th mission, this B-24 was abandoned over England and the crew had bailed out. However, the ball-turret gunner hadn't received the word. Imagine his surprise at finding himself alive—and completely alone—when he walked away from the aircraft after it had crash-landed!

There were many who opposed using the heavy bombers to soften up the transportation and other sites along the Normandy coast instead of keeping up the pressure within Germany. Some felt that the fighter-bombers were more suitable to the task. However, the B-17s did have very good results against NOBALL and other targets, and were able to keep some pressure on Germany, as evidenced by the successive raids on Berlin. In addition, they helped destroy many of the airfields in France, which was necessary to help prevent air defense from being effective during the Normandy invasion.

Throughout the German-held territories, resistance and partisan groups had been actively opposing their oppressors for as long as the occupation had endured, despite the swift and deadly reprisals they often endured at the hands of the Gestapo. However, in preparation for the

invasion, as many as 35,000 French Resistance fighters prepared for a general uprising to thwart the German response when the attack came. Likewise, in Yugoslavia, Tito's rebel forces were preparing to disrupt the German supply and transportation lines on a large scale to prevent the transfer of troops and equipment from the Baltics to the West.

In Italy, General Alexander had finally gotten his forces strong enough for a final assault on Monte Cassino. With three to one superiority, it still took the Allies seven days to break the German lines.

Eisenhower was the supreme commander in charge of Overlord.

One of the most desirable targets was oil. There were many who felt that crippling Germany's synthetic oil industry would certainly hasten their demise, but others, including General Eisenhower, were more concerned with the safety of the upcoming invasion. However, it was reasoned that attacking the oil sites would also flush out a determined fighter defense from the Luftwaffe, accomplishing more of the POINTBLANK mission as well. So several raids were sent out on May 12th and 13th against oil plants. One raid to the Leipzig area met the expected resistance, but was able to deliver 98% of its bombs within 2,000 feet of the target. The other raids on the 12th were also very effective despite losing 46 bombers to the determined Nazi fighters, who lost 66 of their numbers. The next day, weather was less cooperative and the planned bombing of oil sites in Poland had to be scrapped, and other targets hit.

The importance of the oil targets was confirmed by various Ultra decryptions that indicated the widespread shortages of oil as well as the reassignment of heavy flak batteries to the protection of the oil industry sites. As Germany ran short of fuel, its military effectiveness began to erode as well. Particularly hard hit was the training program for new pilots. With barely enough fuel to keep the tanks and combat aircraft running, not to mention almost every other machine in the armed forces, there just wasn't anything left to allow new pilots to get the necessary hours in the air. Without a good level of experience, they were often barely able to control their aircraft, much less maneuver against better trained American pilots or fly effectively against a box of B-17s.

Both sides were preparing for the invasion, though the Germans weren't expecting it any sooner than late June. Rommel had been put in charge of laying down barriers, some of them mined, in the shallow waters along the Channel coast. Meanwhile, British intelligence intercepted several messages that gave the Allies comfort. One involved the widespread damage the bombing of transportation targets had caused in France. Another, from Göring, ordered that the Todt Organization continue activities at bombed-out airfields to fool the Allies into wasting effort bombing them again, even though they were already useless. Though the Allies were not fooled by this tactic, the Germans were, themselves, the victims of misinformation as reports were leaked to them by a double agent about massive troop build-ups in Yorkshire and Norfolk. These reports supported the Allied deception that an invasion would take place at the Pas de Calais.

Meanwhile, as preparations for Overlord and battles along most fronts were favoring the Allies, the deportation of three quarters of a million Hungarian Jews began, with 4,000 people being removed each day. The majority of them were gassed on arrival at Auschwitz. The rest were to join the swelling ranks of Nazi slaves which by now included Polish, British, French, Soviet, and Yugoslavian prisoners.

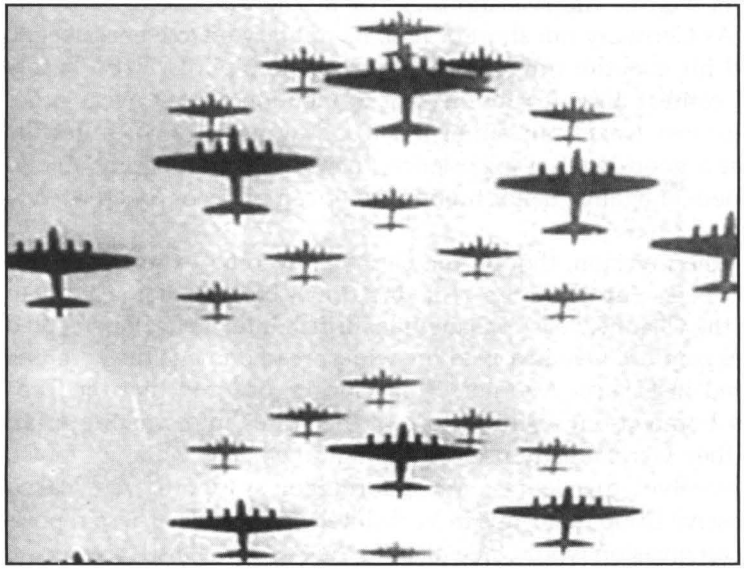
On May 18, the Allied troops finally established control of Cassino. In all, more than 4,000 Allied soldiers had died and an equal number were simply missing, presumed dead. The whole hillside was pitted with craters and littered with bodies and debris.

Weather caused many bomber missions to be aborted, but on the 19th raids were sent to Berlin and Brunswick, both places where heavy opposition was expected. Over Brunswick the opposition did materialize, and while one detachment of fighters engaged the escort, another attacked the bombers with some success.

The Adventures of 'Kidd' Hofer

The excerpts on the next few pages are taken from the logs of the 4th Fighter Group as they were written day by day.

28 May 1944: F.O. 352 Maj. Goodson led a Penetration Target Withdrawal Support to Ruhland-Dessau, Germany, from 1145 to 1710 hours. The P-51s found their Forts at 1350 near Gardelegen at 22/23,000 feet. Just after joining up, the pilots saw 20-plus 109s and 190s approaching from the southeast at 26,000 to attack the wings that had split off for Magdeburg. 334 bounced, breaking up the attack, scoring seven and one-half kills--the half was Lang's share with a P-38. Two more pilots went down to be captured. Continuing on to the target, the bombers left at 1505 west of Saalfeld; the Group broke escort at 1534. Though Hofer got a 20mm hit in his QP-L's rudder, he did a victory roll over Debden, feeling the oats of getting six kills so far in May. It was only a prelude to the next three days.



Most of the missions in late May were involved in the CROSSBOW targets, those designed to facilitate the upcoming invasion, but on May 28th a record force of 1,282 heavy bombers was sent out to bomb oil industry targets. Some wings of the bomber stream were attacked by Luftwaffe fighters. The heaviest resistance was encountered over Magdeburg where the Germans had amassed about 300 planes. Despite the furious fighting in which several bombers were downed, the bombing for the day was accurate and effective.

As D-Day approached, Enigma continued to serve the Allies well. They were able to decrypt numerous messages that indicated the state of the transportation and the deployment of men and equipment throughout the invasion zone. In one case, they were able to readjust plans and avoid a disaster when the Germans moved troops into an area where paratroopers were supposed to land.

MAY 28 MISSION

P-51B MISSION 2

Escort B-17s to Magdeburg

On May 28, 1944, General Doolittle sent a record 1,282 heavy bombers to bomb various oil targets in Germany. Air crews were briefed for seven primary targets, three of which had been hit by the previous raid. To deceive the Luftwaffe, leading combat wings were directed to attack other highly important targets in the area of the oil installations. This strategy proved successful, as it forced the Germans to dilute their defenses, and allowed the bombers to hit the oil targets with less interference overall.

Your Mission

As part of the 4th Fighter Group escorting the 401st Bombardment Group to bomb an oil refinery at Magdeburg, you and your wingmen must protect the B-17s from attacks by enemy fighters.

Strategy

In this mission, enemy fighters approach you and the bombers from all directions. The fighters approaching from the east are targeting the bombers. The enemy fighters approaching from the south are targeting you. Stick with the bombers at all costs and don't fly to the attacking fighters.

THE END OF MAY

29 May 1944: Hofer and Frank Speer attacked Mackfitz airdrome near Stargard and destroyed seven He 177s between them before Speer was hit by flak. He was captured after bellying in near the field.

The following day, May 29, more B-17s and B-24s were airborne, attacking an oil site at Politz in Poland as well as several fighter assembly plants. Opposition was light and the escort effective, and bombing was devastating. In one case, a Focke Wulf factory was put out of business until August. It appeared that air supremacy was inevitable at this point. The success of POINTBLANK was becoming apparent.

31 May 1944: F.O. 355 Maj. Goodson was in the lead again, taking the Group on a Free Lance General Support to Mulhouse-Colmar-Strasburg, France, from 0855 to 1245 hours. Towering cumulus split the Group into squadrons southeast of Namur; the bombers faced the same problem. The controler, "Colgate," told the Group to abandon the briefed mission and remain with the bombers. 334 was vectored to Charleroi to escort a small box of bombers out to the coast. Kidd Hofer continued on and joined up with the 357th Fighter Group escorting bombers to Luxeuil airdrome. After the bombing Hofer went down in with his newfound buddies and destroyed three Bu 131s. In the last four missions, Hofer had destroyed 10 1/2 to tie him with Goodson at 15 aerial and 15 ground kills...

Air Sea Rescue. Four kites were sent up to look for Hofer, who had not been heard from since 0950 when it was thought he had aborted at the enemy coast. The Kidd came gleefully in at 1430.

JUNE 1944

Missions in early June primarily involved invasion preparation, though some mission were flown to deeper targets. Still, the missions to parts of France, once considered to be milk runs, were now highly dangerous as Hitler continued to build up his anti-aircraft emplacements. At least a quarter of the bombers would eventually be hit by flak, and about 13% of those hit would be shot down. Those were the odds, but they were compounded when flight leaders decided to deviate from carefully planned routes. This happened on more than one occasion, causing planes to fly through devastating flak barrages. Here's a short section of the report from 1/Lt. Chester Weeks aboard the Betty and Jim when it failed to follow the recommended flight path:

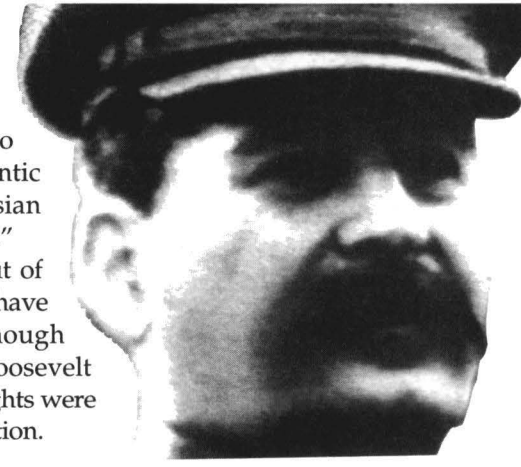
"...At this point we got a flak hit in our hydraulic lines and couldn't close the bomb doors so left them open as we proceeded to the secondary. Crossed Paris and began secondary run on Creil airfield. Another flak hit tore through left side of ship, breaking pilot's rudder control cable, more hydraulic lines and an accumulator and tore his boot, bruising his foot and numbing his leg to the knee. We thought the hydraulic fluid was blood but the skin wasn't broken. He couldn't use his foot, however, and the co-

pilot had to fly the rest of the mission by himself. Flak—apparently an unexploded shell—tore through the nose, making a gash two feet long and six inches wide, knocking the navigator down. A later burst sent fragments through the left nose window, tearing his map and putting a small hole in the back of his flak vest but he was unhurt..." (from **The Mighty Eighth**.) The report goes on to describe planes falling out of the sky, more flak barrages and hits over Rouen and Dnieppe, and, eventually a safe, if damaged, return home.

Because of the accuracy of the AA, many experimental methods were tried. Among them were glider bombs, which could be released farther away from the target, and special radio-controlled Azon bombs. Neither type was ultimately considered successful, however, and the heavies continued on their tried and true, if dangerous path.

The strength of the VIII Bomber Command had continued to grow, and by early June there were 2,500 heavy bombers in service with replacements readily available. As D-Day approached, the Allied control of the skies seemed uncontested, prompting Eisenhower to make his famous statement, "Don't worry about the planes overhead. They will be ours."

Operation Frantic Joe and the Fall of Rome



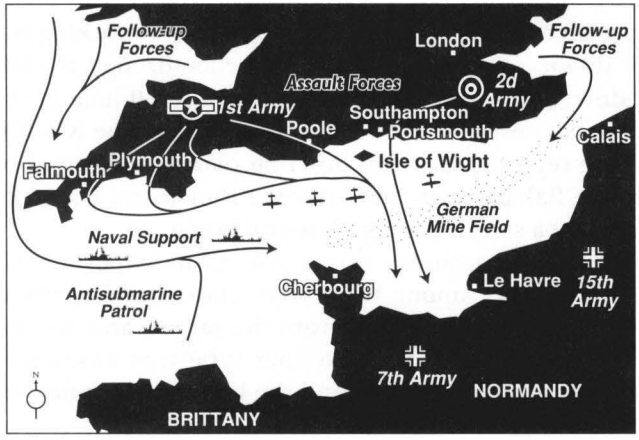
On June 2, a force of American bombers flew from airfields in southern Italy, bombed industrial targets in Silesia, Hungary, and Roumania, then continued on to Russia. These bombers had been sent in response to Stalin's appeals, and the operation was known as "Frantic Joe" until it was changed to avoid offending the Russian dictator. The new name was simply "Operation Frantic."

On June 4, American troops drove the Germans out of Rome and pursued them north of the city. This should have been a day of great satisfaction for the Allies, and, though Churchill did send a message of congratulations to Roosevelt ("How magnificently your troops have fought!"), all thoughts were on the imminent invasion. There was little time for celebration.

D-DAY

Eisenhower was in possession of secret German communications between Rommel and Hitler, and was aware that the Germans were expecting an invasion, but only when four days of good weather could be predicted. They also expected several diversionary attacks to be made before

D-Day Invasion Strategy



the main thrust. Therefore, despite continuing poor weather conditions, he decided to go ahead with Overlord on June 6th—D-Day.

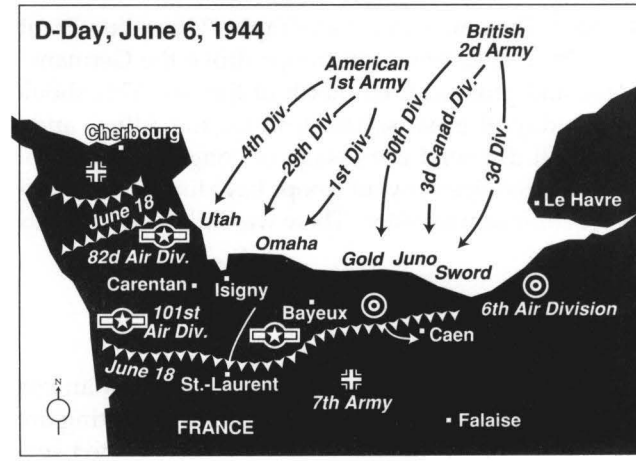
As the invasion began, a coded message was sent openly over the BBC to the French Resistance instructing them to cut the railway lines at 1,050 locations. The Germans had partially broken the code, but word of the message was largely ignored at Rommel's headquarters in France because the general was on his way by automobile to meet personally with Hitler in Germany. Rommel did not expect an attack this soon, as the Enigma messages had revealed. Nine hundred and fifty of the rail lines targeted were broken.

Meanwhile, British bombers hit the main gun emplacements with 5,000 tons of bombs on the night of June 5. Finally, as the real invasion began, several false convoys were simulated with motor launches and electronic equipment or even the dropping of massive amounts of window (radar jamming strips). In another mission of deception, dummy parachutists were dropped near Boulogne.

The first real troops to arrive were from the British 6th Airborne Division who flew behind the lines on gliders and landed near the village of Benouville.

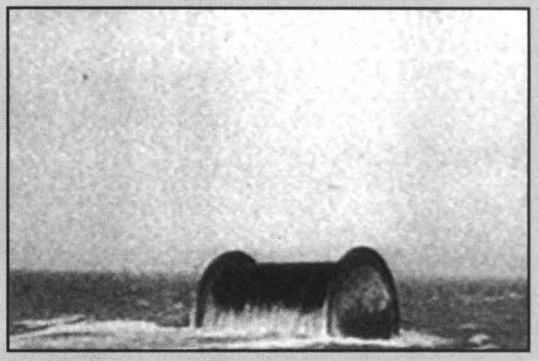
The first troops to land on the morning of June 6 were Americans who attacked the beachhead known as "Utah." Other beaches, Gold, Sword, Juno, and Omaha were all attacked subsequently. By midnight, 155,000 troops were already on French soil. Only at Omaha had the Germans been able to contain the invading forces, where 35,000 Allied troops were surrounded and prevented from advancing.

Enigma played a significant role during Operation Overlord. From its decrypted messages, the Allies learned from numerous sources within the German command structure that these Normandy invasions were thought to be only a diversion. Even after three days, the ruse so carefully set up over the previous months was working. Hitler and his generals were still expecting a maximum effort to occur at Pas de Calais, and consequently were unwilling to commit their full forces against the Normandy beaches.



Preparations for D-Day

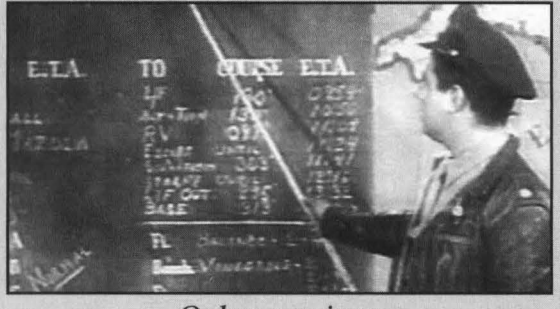
This innocent-looking ice cream parlor is really a fuel pumping station.



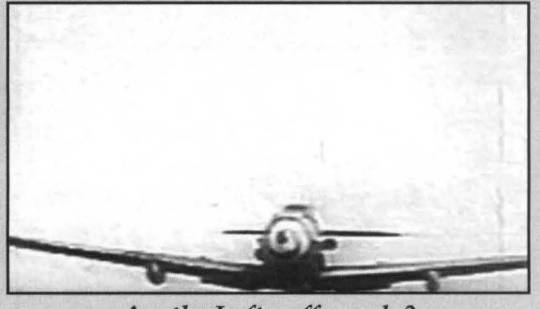
A rolling spindle of pipe is laying fuel lines across the Channel.

Allied aircraft have been secretly repainted with special D-Day markings.

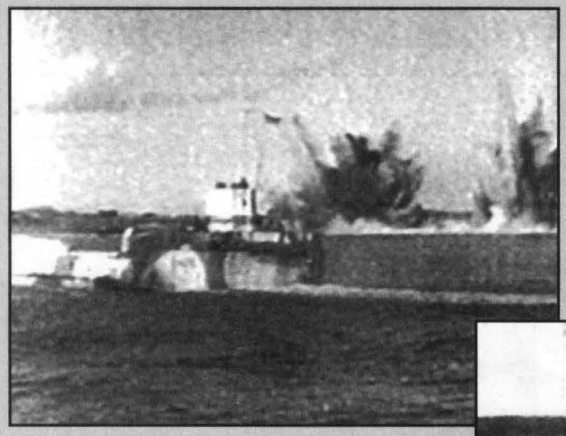
Fighters and bombers destroy transportation in German-occupied territories.



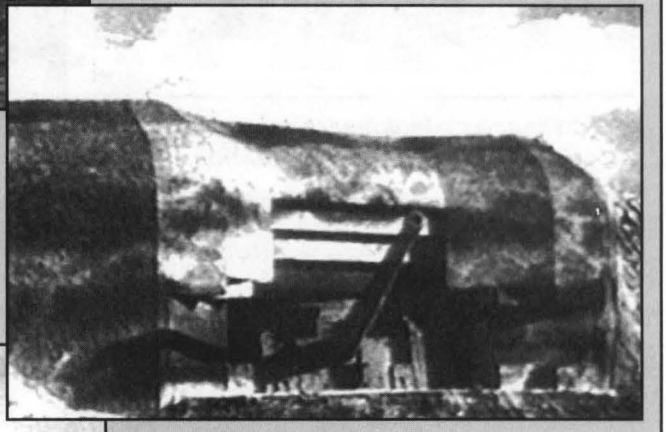
Orders are given.



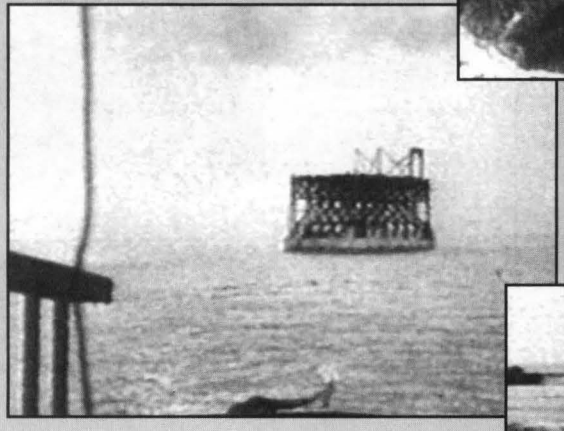
Are the Luftwaffe ready?



First the shelling starts. . .



While German soldiers wait in pillboxes.



The artificial harbor, "Mulberry," is towed across the Channel and assembled on the other side.

An anti-barbed wire gadget that would rotate rapidly and pick up the barbed-wire on a spindle.

Thousands fought their way to the beaches on D-Day.

Meanwhile, on June 7, Enigma reaped a different, but no less important, harvest. A German Air Force message described the growing shortages of aircraft fuel. A message the next day from Chief of Staff Sir Charles Portal to Churchill stated that he considered this "one of the most important pieces of information which we have yet received." He recommended that the British bombers concentrate on Germany's synthetic oil plants "as soon as Overlord can spare them." General Spaatz made the same determination regarding the American bombing effort. From D-Day onward, Germany's oil and fuel were to become top priority targets, and many would say that the destruction of Germany's capacity to fuel its war machine was as significant as the Normandy invasion itself.

"'Overlord' is a source of joy to us all."
—Josef Stalin, June 8, 1944 in a message telegraphed to Churchill.

By prior agreement, Stalin began preparations for an all-out assault on German lines in the East, designed to prevent Hitler's forces from being transferred to oppose the Allied invasion. Small raids and acts of sabotage prepared the way for a massive counterattack on the German lines. The real attack was to take place almost two weeks later.

At this point, four days after the initial invasion, the Germans were convinced that the main invasion was still to come. This view was further reinforced by messages received from one of their agents in Britain. Code-named "Arabel," this agent was Juan Pujol Garcia, and he had been on the British payroll as a double agent for three years, carefully building his credibility for just such a moment. Citing information gathered from his "sources," who included some entirely fictitious entities, Arabel, known to the British as "Garbo," was to describe the Normandy landings as "a diversionary manoeuvre designed to draw off enemy reserves in order to make a decisive attack in another place."

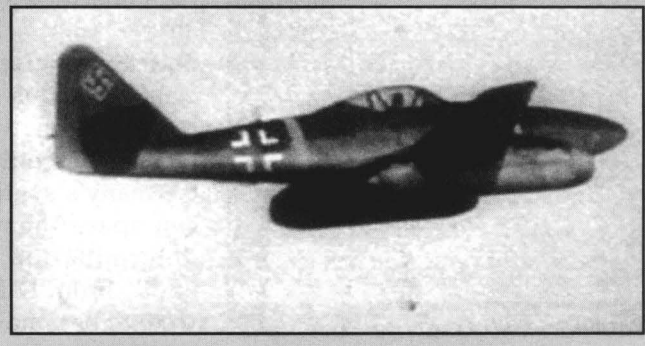
The Germans still had some surprises up their sleeves. Soon after the Normandy invasion, they were able to lay some new, highly advanced mines in the waters. These mines could not be destroyed by the usual methods. Known as "Oysters," the new German mines were to cause a great deal of trouble, often causing ships passing among them to slow almost to a standstill.

German motor torpedo boats were also causing problems for the invaders, sinking ships and threatening to disrupt supplies, but several bombing raids against their launch points eventually destroyed them and eliminated the threat.

Also, in the early morning hours of June 13, the Germans launched the first of their secret flying bombs—the V-1 "*Vergeltungswaffe*" (Reprisal) I. This first launching however was less than auspicious, as half the bombs crash-landed near their launch sites and only one actually caused any damage at all, landing in London and killing six people.

Two days later, a more determined, and more successful, V-1 attack was carried out from the "Ski" sites at Watten. Shooting off 244 of the flying bombs that day, the Germans were able to get 73 of them to land on London, killing 50 people. Several launch sites were themselves destroyed as 45 of the bombs crashed on takeoff. A few of the bombs were shot down by anti-aircraft fire and some by fighters. The British, mindful of the potential panic these bombs could cause, ordered the newspapers to limit the number of obituaries for people killed by enemy attacks to only three from any postal district.

The Me 262



Late in May, the first indications of the German jet fighter, the Me 262 were discovered. The jet itself was not yet seen, but runways blackened by the jet blast were observed by RAF reconnaissance aircraft. By the end of June as many as jet 30 airfields had been identified.

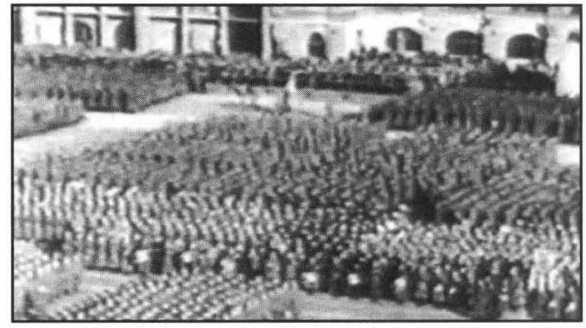
As the launchings of V-1s increased, their effectiveness in killing civilians also increased, and in one three-day period, more than 250 deaths were attributed to them, not one of them with any military significance. One bomb, ironically, flew way off course and landed near Hitler's headquarters at Soissons.

Coincidentally, an experimental version of the V-2 rocket, test flown from Peenemunde, landed in Sweden where it was examined by British agents and eventually sent to Britain for examination. As the terrors of the V-1 were just beginning to make themselves known, the British had now to concern themselves with the even speedier V-2 rockets! (Actually, the V-2 may have been a little less deadly as they tended to bury themselves into the ground before exploding.)

The destruction of transportation systems within France continued as the French Resistance forces, led by secret British agents, destroyed bridges, fuel dumps, and rail systems. One Panzer division, ordered from Toulouse to Normandy on June 6, took 17 days to complete what should have been a three-day journey due to the well-coordinated efforts of two of Britain's Resistance leaders, George Starr ('Hilaire") and Baron Philippe de Gunzbourg ('Edgar") along with another French leader known as "Nestor".

When it did come as promised by Stalin on June 22, the Russian attack was not a small diversionary mission or nuisance raid. Astonishingly, despite the extreme losses suffered by the Russians during the successive battles of their country, the Red Army launched 1,700,000 troops

with 2,715 tanks, 1,355 self-propelled guns, 24,000 artillery, 2,306 rocket launchers, and 6,000 aircraft against the German lines, driving them back along a 200-mile front. In a week, they had killed 38,000 Germans and captured 116,000 more. Meanwhile, the Allies had landed more than half a million troops at Normandy and the Germans were still looking for the fictitious First United States Army Group and their attack on Pas de Calais.



Part of the seemingly inexhaustible Red Army.

D-DAY AIR SUPPORT

The orders for the pre-invasion bombing for June 6, 1944—D-Day—were long and complex. In all, 2,362 sorties were flown by the heavy bombers that day, not to mention the countless flights by fighters and fighter/bombers. Among the orders given, were specific warnings to avoid short bombing as there would be assault troops ranging anywhere from one mile to 400 yards from the targets. Also, if they missed their target on the first run, there would be no second runs and no planes should fly over the bomber routes across the Channel unless they wanted to be shot at. Most bombing in the morning had to be accomplished using the Pathfinder radar-equipped planes. Some bombs were dropped on villages that were hubs of transportation, but only after leaflets had been dropped previously to warn the French civilians to make tracks.

Of course advocates of the strategic bombing had hoped that such an invasion would be obviated by the bombing campaign itself, but, as effective as the bombing had been, it had not been enough to make Germany capitulate. So the D-Day invasion took place as planned.

On the actual day of the invasion, the skies belonged to the Allies, as predicted. Of the 2,362 heavy bomber sorties of the day, only one B-24 was lost to enemy action.

On June 5, paint cans marked "for the cake walk" were distributed to certain P-38 groups. Special markings were painted on the planes for easier recognition. It had been decided that the Lightnings would perform constant sweeps of the Channel during the hours before the landing and during the actual invasion. The P-38s were chosen because their distinctive shape would hopefully prevent nervous gunners on the invasion craft from mistaking them for enemy aircraft and opening fire.

Meanwhile, other fighter groups performed bomber escorts, strafing missions, and general

> 6 June 1944 F.O. 371-Part 1. At 0130 everyone was awakened after only a couple of hours sleep. Col. Blakeslee led the first mission of the day, a Fighter Sweep by 334 and 335 of the Rouen, France, area from 0320 to 0945 hours. Landfall was made over Dieppe at 0409 but dense cloud prevented pin-pointing and claimed Thomas Fraser, who went down after 0642 east of Rouen to be captured. Changing winds caused the formation to drift east of Paris and come out at various points east of Calais. Hofer strafed a couple of locos after blurting over the R/T, "Whoo, a train!"

patrol all over the skies of France. Different kinds of duties were given out using special code words based on poker—stud, royal flush, or full house. Other than a few scattered encounters with the Luftwaffe, including the shooting down of 15 Ju 87 Stukas trying to fly up the Channel, there was very little contact with the enemy in the air. Most of the Luftwaffe's fighters were concentrated in Germany, and only about 80 of them were operational in France.

This situation was corrected quickly, however, as the Germans sent reinforcements to the new area of conflict. With more fighters, the Luftwaffe attempted to strike back. They used their planes to bomb Allied troop positions as well as to bounce the American fighter/bombers with some success. On one occasion, they shot down five planes from one P-47 group. The next day, the Americans were up, and one sent over the radio the following message: "Hello Oilskin, Hello Oilskin. I'm orbiting over Dieppe. I am at 15,000 feet and flying east—and that goes for you German bastards too, just in case you're listening in. Come on up!" This was hardly standard procedure, but did emphasize the aggressive spirit of some of the fighter groups.

In another instance, fighters of the 353rd were bounced by a group of experienced pilots in Bf 109s and lost eight. The next day, in cooperation with their neighboring group, the 56th, they set a trap for the same Luftwaffe gruppe by flying alone over their airfield. Half an hour later, the 56th joined the fight that ensued, and both groups were able to avenge the losses of the day before, inflicting much damage on the 109s by shooting down 14 while suffering little in return.

In addition to other advantages already noted, the American pilots benefited from improved technology including a new 150 octane fuel, new water injection systems, and new propeller blades, all of which increased the performance of their planes and made them even more effective against the Luftwaffe planes. Although the Germans were developing new technology themselves, notably the Me 262 jet and the Me 163 rocket plane, as yet these were in very short supply and weren't factors at this phase of the war. The Me 262 in particular had been hampered by Hitler's insistance on making a fighter/bomber out of it despite Galland's fervent support of it as a pure fighter. This is often the reason cited for the Germans' failure to produce the jets in quantity earlier in the war. However, the truth may be that the early production versions of the 262 were only able to fly for about three or four hours. Though the hand-built prototype models had sufficient operational life, it took a long time before the challenges of mass production were solved.

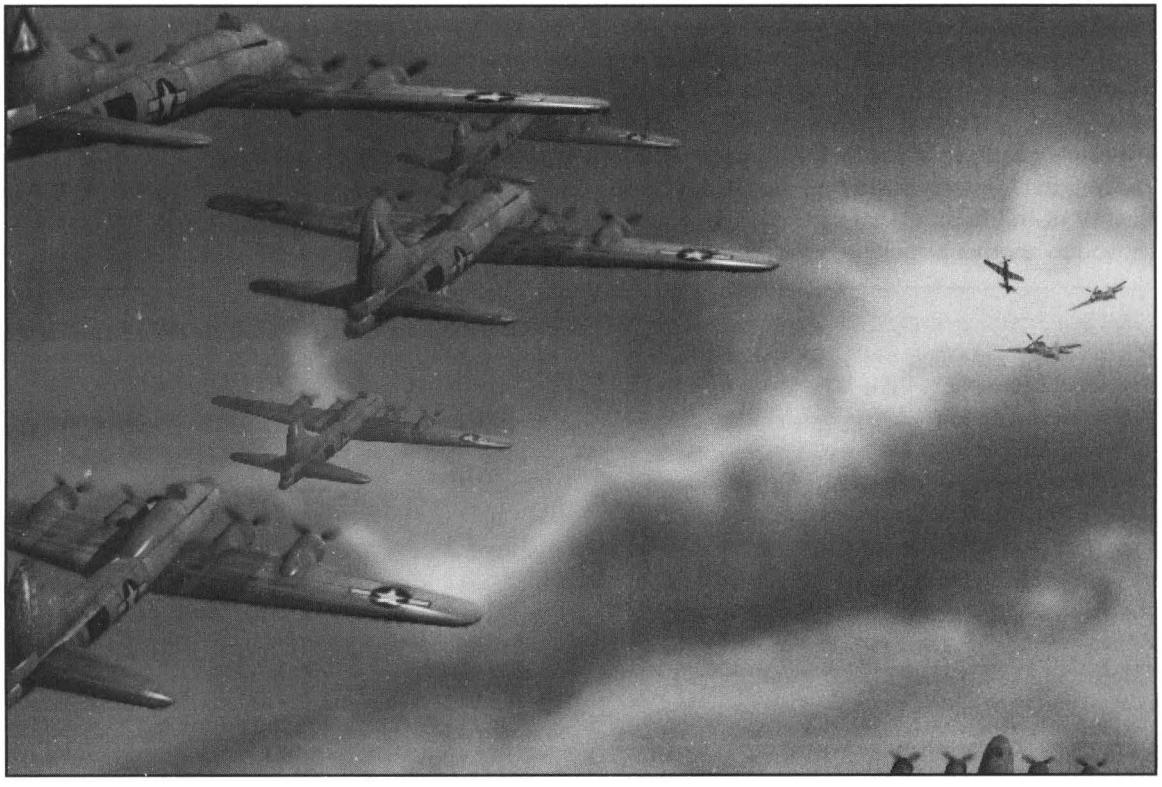
11 June 1944: F.O. 382-Part 2. Lt. Col. Clark led more Fighter Bombing to the Vire area, France, from 1155 to 1510. Ten miles southwest of Vire the P-51s bombed and strafed 70-plus trucks. Both Harry Noon and Leon Cole were killed, the former hitting some trees with his two bombs still attached and the latter by flak. Enemy air support was sent in but there was too much ammunition gone to stay and fight. Thirty-two trucks were left destroyed. Hofer's oil system was punctured by small arms fire and he was forced to land at a forward air strip in Normandy. Maj. Gen. Ralph Royce, 9th Air Force CO, met him and escorted him on a tour of the front.

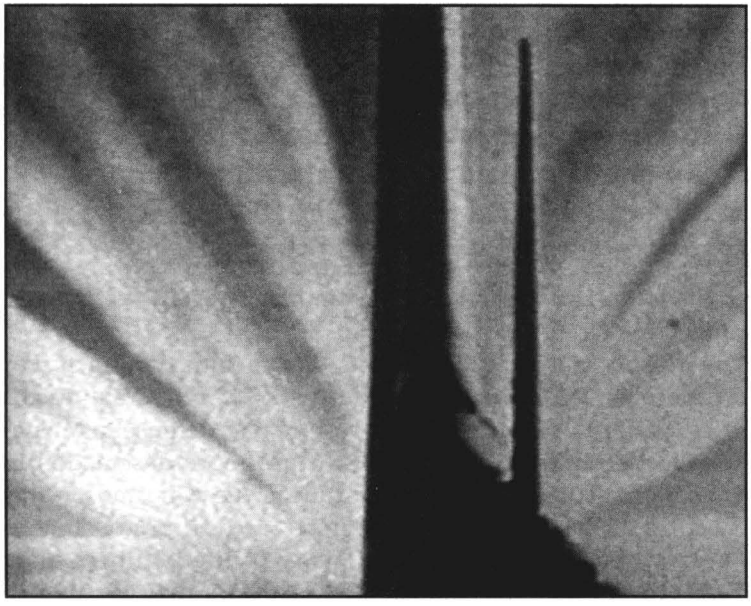
The day after D-Day, several large missions were sent out, but met with very little resistance. Three Liberators were shot down when a group of Me 410s ambushed them as they were attempting to land at their home field after darkness, but

"This is the end of the Third Reich, and the guilty can now be brought to punishment."
—Professor Walther Arnt, physician and zoologist, executed for making this statement after a heavy bombing raid on June 26, 1944

otherwise, losses were minimal. For the following days, the most common targets were bridges, rails, airfields, and other targets designed to help the ground troops.

On some occasions, bombers were still sent out after targets deeper into the Reich. For instance, on June 20th, a new record number 1,402 bombers set out with 718 fighters in escort to bomb critical German oil facilities. Some Luftwaffe fighters rose to the defense, as usual picking their spots carefully. However, the bombers were able to cause more destruction to many of the targets. Many bombers sought sanctuary in Sweden during the war, and on this day 20 heavy bombers arrived at Swedish airfields. The usual "refugee" arrived pretty shot up and unable to make it back to England, but on this occasion, many of the bombers were undamaged, causing some raised eyebrows and some questions. Why were they landing in Sweden if they were not in trouble?

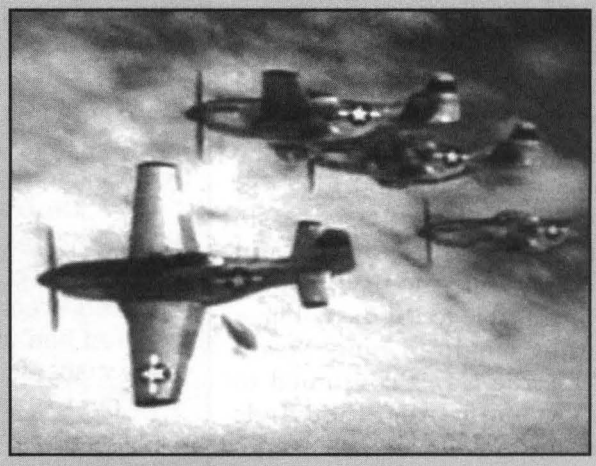




However, the biggest danger that day, as on most days at this point in the war, was flak, which continued to get its share of Forts and Liberators. In one story, a bomber was shot down probably after responding to a false course correction message that actually was sent by the flak battery and put the bomber right where they wanted it!

On June 21, another huge force was sent out to Berlin—1,311 heavy bombers escorted by 1,190 fighters. The Germans did manage to send up some effective opposition that day, claiming 44 heavies, but, with good visibility, 2,000 tons of bombs were dropped accurately on targets around the city. Some of the bombers then continued on to Russia to equip new American bases there. The flight over, though long, was relatively uneventful, but the night of their arrival made up for that. The Germans mounted a surprise night raid on the airfield at Mirgorod, sending in 60 He 111s and Ju 88s. In the course of the raid, 44 of 72 Forts were destroyed and another 26 damaged along with 15 other Russian and American aircraft. Twenty-five Russians lost their lives, but, miraculously, only one American. Adding these losses to those in the air during the day, this marked the costliest 24-hour period in the history of the Eighth Air Force with 88 bombers lost and 22 fighters. The remaining bombers were moved to another airfield in anticipation of a follow-up attack the next night, which did occur.

21 June 1944: F.O. 407. Col. Blakeslee led a Ramfod Shuttle to Ruhland, Germany, and Leszno, Poland, from 0755 to 1450 hours, landing in Piryatin, Russia. Blakeslee was all business in the briefing--there would be no fighting on the way over, no dropping of tanks and no R/T chatter. "No one will abort because of lack of oxygen. You'll be at 15,000 feet. You don't need it. You have no business in the group if you have to have oxygen at 15,000. If you get dizzy, go down under the bombers for awhile. . . . This whole thing is for show. That's why everything must be pansy. It's not what you do, but what you seem to do." Blakeslee wanted to lead the show bad enough to have an extra Mustang standing ready in case his WD-C had to abort. He stuffed 16 maps into the cockpit with him to assure a "pansy landing" at Piryatin. Hofer was giving his CO, Hively, a headache since the Kidd refused to take his shots, even on orders. Hively flatly told Hofer he wasn't going. Hofer relented at the last minute but the Deacon sent him packing to fly with another squadron and gave "Salem Representative" to Preston Hardy.



Forty-five mustangs of the 4th along with 16 P-51s of the 486th Fighter Squadron, 352nd Group, crossed Overflakkee at 0903 at 20,000 feet. Cruising over a solid undercast half way to Berlin, the fighters rendezvoused on time with three wings of B-17s over Leszno at 1113 after Ruhland had been bombed. At 1240, 25 Bf 109s came in for a head-on attack against the bombers. The enemy fighters were engaged but the advantage could not be pressed due to fuel restrictions. Two were destroyed for the loss of Frank Sibbett. Disregarding orders, Hofer continued to chase the Germans on the deck. He was listed as MIA until word filtered in later that he had landed at Kiev. S/Sgt. Robert Gilbert, a 336 crew chief who had served Goodson, was forced to bail out of one of the B-17s the 33 enlisted men were flying in. He fought for 36 days with Polish guerrillas against the Germans before returning to Debden on 17 August. The Group escorted the Big Friends beyond Russian lines for a total distance of 580 miles. Upon sighting the Russian field, on time to the minute, Blakeslee threw all 16 of his maps into the air within his cockpit.

That night, as the bomber base at Poltava was severely pounded by the German bombers, Piryatin became a madhouse with chandelier flares and anti-aircraft going off all over the place. 4th pilots spent an uneasy night in the trenches. Siems and Blanding couldn't get out of their sleeping bags so they hopped all the way to the trenches.

The build up in the American bomber offensive is graphically stated if you compare the 2,154 sorties flown during June 1943 with 28,791 in the same month a year later.

During June, the VIII began removing ball turrets from B-17s. The advantage of being able to fly higher to avoid flak was more important than the added firepower.

The Flying Fortresses found a new duty in June—supporting the Maquis (the French Resistance). Special squadrons of black-painted B-17s dropped a variety of supplies into France on pre-arranged signals. In the first six months of these operations, the Carpetbaggers, as they were called, flew almost 800 individual sorties and dropped 115 special agents (presumably by parachute), 5,439 weapons packages, 2,707 miscellaneous other packages, thousands of leaflets, and 17 pigeon containers.

Tragically, the heroic and lucky escape of four Jews from Auschwitz was largely wasted. These four had escaped to tell the world of the horrors occurring in the Nazi concentration camp and the gas chambers where, in a single six-week period, more than a quarter of a million Hungarian Jews had been gassed. Urgent appeals were sent by the escapees to British authorities begging that the rail lines

leading to Auschwitz be bombed. Despite the fact that both British and American military leaders were to study these reports, and even Churchill personally authorized such bombings, both the Americans and the British did nothing, apparently seeing no military purpose in it, and probably believing that it would be impossible to cut the rail lines for any length of time. Meanwhile, the Nazis continued to deport and murder thousands more people.

Public outcry resulting from the disclosure of the four escapees did produce some results. Appeals came from diverse sources including the Red Cross, the King of Sweden, and Pope Pius XII. American bombers dropped leaflets over Hungary threatening punishment for those responsible for the deportations, and within two days, the deportations were ordered stopped. Although nearly half a million Hungarian Jews had already been deported, most of them to instant deaths, at least 170,000 in Budapest alone were saved by this order.

29 June 1944: F.O. 422. Lt. Col. Clark again led a composite squadron of 12 kites with the 352nd Group on a Penetration Target Withdrawal Support to Liepzig, Germany, from 0700 to 1220 hours. Rendezvous was made with the Liberators at 0833 and escort was broken near Dummer Lake at 1035 and 30,000 feet.

Meanwhile, the four aborts of the 26th left Poltava to rejoin the rest of the Group in Italy. Hofer, again on strict orders not to bounce the enemy unless bounced, went off chasing bandits. Callahan broke and covered him; both ran short of fuel. While Gillette and Lane made it safely to Foggia, Hofer overshot Italy and was guided to Malta by Spitfires, where he spent the night. Callahan ran out of fuel and crash landed on the beach at Sampieri, Sicily. He was picked up uninjured by the British and taken to Catania. The next day Hofer flew from Malt to Catania to see Callahan, then on to land at Foggia. Callahan was flown to Algiers, Rabat and England by the British.

JULY 1944

By July 2, more than a million men had landed at Normandy, and at least 41,000 Germans were being held as POWs. In the East, the Russians continued to move steadily, killing and capturing hundreds of thousands of German soldiers. In Italy as well as in the Far East, the Allies continued to advance.

July was another busy month, with thousands of bombers flying. It was common for raids to be sent to a dozen targets on a single day. Most of the activity was still in support of the invasion operations, but there were still several missions that returned to the oil plants in Germany and Poland.

The V-1 attacks continued and became a source of concern for Churchill and the British authorities. Almost 3,000 casualties had been caused by the bombs, at an averaged-out rate of about one death for each bomb that fell.

Several bomber missions were spared from their support of the Normandy forces and sent to destroy known V-1 depots. Though some of these raids were very successful, the bombs continued to fall on the English cities.

Hofer's Last Chapter

2 July 1944: F.O. 15th AF. In concert with the 52nd and 325th Groups, Col. Blakeslee led the 4th in a Fighter Sweep to Budapest, Hungary, from 0740 to 1250 hours. Forming up over Lake Lesina, the Mustangs went on to the target where 75 to 80 109s were encountered. The Huns were very aggressive, pressing attacks at all altitudes. Hively, after destroying a 109, was jumped and shot up, losing his canopy which gave him a good crack on the skull and wounded an eye. Grover Siems shot the Hun off Deacon's tail but Siems was then jumped and severely wounded in the shoulder, neck and chin. With his left side paralyzed, he had to kick down the gear handle with his right foot but after getting down he was so weak he couldn't get the canopy open--he kicked the gun switch on, fired his guns to attract attention and was pulled from his ship. He was returned to the States in serious condition. During the roaring dogfight at 1045 four of the Group's pilots were shot down, two killed and two POWs. One was Kidd Hofer, who was last seen over Budapest climbing to engage 20-plus 109s. The wreckage of his Mustang, QP-X, and his body were later found at Mostar, Yugoslavia.

Although the Luftwaffe continued to bag its share of heavies, by now the loss rates had no chance of achieving the German goals, namely of making the losses unacceptable and making the Americans withdraw the bombers. When more than a thousand bombers flew a mission, a loss of 20 or 30 was considered "acceptable." On July 7, the *Sturmgruppe* was able to claim high numbers, though their claims of 30 for the gruppe and 54 for the whole *geschwader* couldn't have been accurate since the number of heavies missing that day was 37.

Some of the Luftwaffe had abandoned the head-on attack that had been so effective and started to attack from the tail. If they could get a good hit on the tail gunner, they had the advantage.

The tour for bomber crews had been extended after D-Day. Now, instead of 25 missions, they had to fly 30 or 35. However, the odds were certainly better for most. A few bomber groups had suffered disproportionate losses, but many other bomber crews never even saw an enemy fighter throughout their tour. At the same time, some of the first operational groups were reaching 200 missions flown. The first to reach that mark was *Hell's Angels* on July 11. Two days after that, the *Travelling Circus* matched them, followed by others as the month continued.

Some of the bombers themselves had begun to set new milestones. Several were participating in their hundredth missions. Most that had survived that long were due to be retired, however.

On July 16, even as conspirators were seeking him out to enlist him in a plot to kill Hitler and take over the government, Rommel was seriously wounded by machine-gun fire from an Allied fighter. The pilot was South African ace, Squadron Leader J. J. LeRoux. Unfortunately for LeRoux, he never knew that he had ended the military career of one of Hitler's greatest generals. Eight weeks later, LeRoux disappeared over the Channel. And Rommel end was not more than two months away.

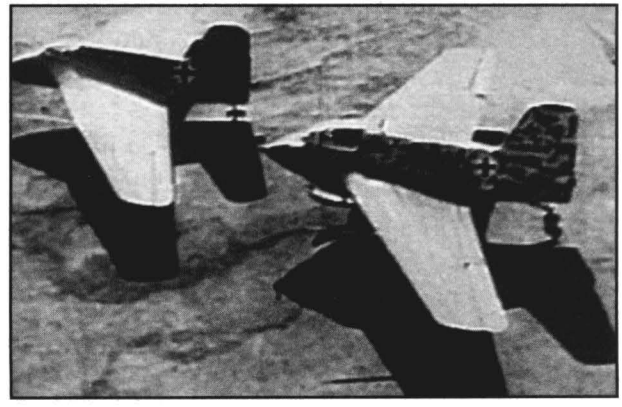
Even as the key target city of Caen was finally taken by the Allies on July 18, Hitler finally agreed to release the forces that had been so long bottled up in preparation for the expected attack at Pas de Calais. The deception plan

known as Operation Fortitude had worked to perfection, keeping the Fifteenth Army cooling its heels while the main invasion continued. Although it took almost a month and a half to capture Caen—it was supposed to fall the first day of the invasion—the Allied objectives had been reached before Hitler was able to bring significant reinforcements to the scene.

On July 20, a conspiracy to kill Hitler reached its conclusion as Count von Stauffenberg, a highly decorated colonel and staff officer, left a briefcase bomb in the map room at Hitler's headquarters in Rastenburg. The assassination almost succeeded, but just before the bomb blew up, one of the officers moved it to the side to get a better look at the map. Although four of Hitler's officers were killed in the explosion, the Führer himself survived the blast. He had been leaning away from the briefcase's location and shielded by a heavy frame and the map table itself. The conspirators, believing Hitler dead, began to take over the government. However, they were betrayed and their attempt failed. All of the leaders were shot or committed suicide, while, in all, five thousand soldiers were eventually executed in the months ahead. One of the leaders, Major General Henning von Treschkow stated before killing himself, "God promised Abraham to spare Sodom should there be ten just men in the city. He will, I hope, spare Germany because of what we have done, and not destroy her."

During July the bombers attempted to destroy the airfields known to support the Me 262 jet operations. They could see the black marks on the runways that indicated the presence of the jets. However, on July 28th a new threat was observed for the first time. It was described as a tail-less jet soaring above the bombers. This was the first recorded sighting of the Me 163, the Komet. On this occasion, the Komets were simply testing. It wasn't until the next month that they began to attack the bomber formations.

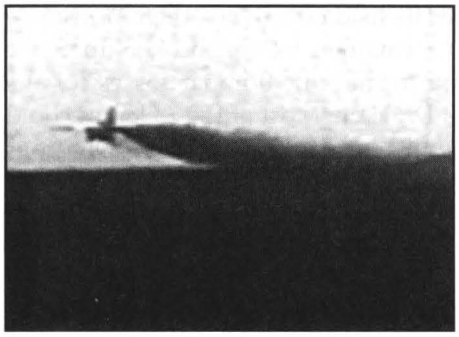
On the next day, Captain Arthur Jeffrey of the 479th was the first of the Allied pilots to dogfight a Komet. Spotting the unfamiliar plane making a pass from the rear of a bomber (but not attacking), he was able to close to within 1,000 yards, but could not climb with the rocket plane. However, the enemy pilot turned into Jeffrey's sights and he was able to get off a few deflection shots from about 200 yards, seeing some hits on the plane, which then began to dive away. Jeffrey followed the plane down where it disappeared into the cloud. Logging 500 mph in his P-38, Jeffrey blacked out while pulling out of the dive, but was able to recover.



Me 163s were a new sight in July.

A week later, the results were more in favor of the new machines as a group of Me 163s successfully jumped three P-51s while a B-17's radio operator watched. All three Mustangs were blown out of the sky. First blood to the Komets.

Also in July, the Luftwaffe officially retired the twin-engined Me 410s. Known as the Zerstörers, these planes had been effective in attacking the bombers until the fighter support was available. Since the appearance of the long-range Mustangs, the Zerstörers had been falling from



Me 163 taking off in the distance.

the skies at increasing rates and had been effectively through since March. Production was being shifted even more to the single engined planes.

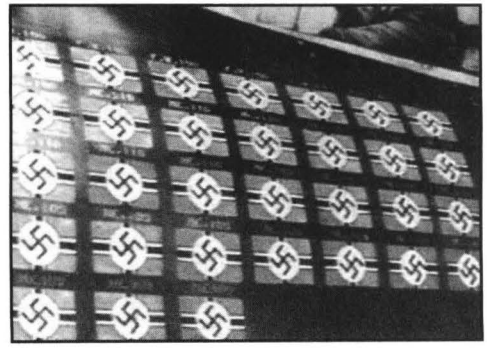
Meanwhile, the American fighters continued to enjoy success against their opposition. On one occasion, on July 4th, the fighters of the experienced 56th Group were conducting a low altitude bombing mission when they sighted a large formation of Bf 109s. They rose to attack the Germans and shot down an incredible 20, damaging another 12 without losing a single plane. Gun camera footage confirmed their claims, including the claim of three victories made by one particular pilot . What made this last claim remarkable was that this same pilot had flown in 65 missions previously without ever firing on the enemy at all. This successful encounter also made the 56th the first group to top 500 victories with 508. By this time, the 56th boasted 38 aces, and, on the following day, their top ace, Gabby Gabreski scored his 28th victory, making him the highest scoring American ace in the European theater.

Gabby was only in action a short time longer or he would certainly have added to his score. But on July 20, he flew too low during a strafing mission and lost part of his propeller. He successfully landed the crippled plane and evaded capture for five days. Eventually he was captured by the Germans, and when he was sent to interrogation, he was reportedly greeted with the statement, "Hello Gabby, we've been waiting for you for a long time."

Francis 'Gabby' Gabreski and his kills.

Weather continued to be almost as great an enemy to the bomber as the German Air Force. Despite the many flights undertaken by the RAF to deliver weather information, that information was often many hours old by the time the bombers flew over enemy territory, and it could change dramatically in that amount of time.

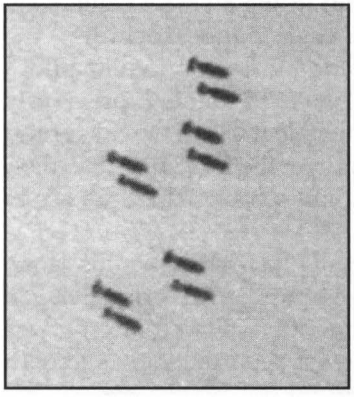
A new group was formed, the brainchild of Col. Budd Peaslee. This group consisted of fighters and fighter pilots whose job it was to fly ahead of the bombers on the missions and scout out the clearest path. An example of their effectiveness came soon after they became operational. On July 16th, they were flying ahead of a large bomber formation headed back to Schweinfurt when they discovered a massive 28,000 foot cloud bank. They were able to determine a clear path around the cloud and radioed that information to the bombers on a special frequency.



The 1st Division bombers received the message, but those in the 2nd Division did not. While the 1st

Division was able to fly unmolested to the target and deliver its load effectively, the unfortunate bombers of the 2nd Division flew into the cloud where their formations became broken up. Some bombers lost contact with the group while others collided in mid-air. Bomber losses for the mission totaled only 3 for the 1st Division and 23 for the 2nd Division. Most of the 23 losses could be directly or indirectly attributed to the weather. Following this incident, 2nd and 3rd Divisions formed their own scouting groups.

On the 18th, the weather scouts again proved their worth as they led a raid on the important Nazi experimental labs at Peenemunde and Zinnowitz. Then, for three days running, the by now usual thousand bomber raids attacked the ball-bearing industry again.



On July 24th and 25th, the heavy bombers were called in to drop saturation bombs on German lines to help the invading troops break through. Weather again proved a difficulty as only a fraction of the more than 1,500 bombers sent out actually dropped their loads. Moreover, there were several incidents on both days that unfortunately resulted in bombs being dropped on the Allied troops. These errors occurred for various reasons. For instance, in one case the bombardier was startled when chaff hit the nose of his bomber and accidentally pulled the bomb lever. In another case, the bombardier had not properly calibrated his sight before the mission, and on his erroneous signal, twelve B-24s dropped almost 500 100-lb. bombs on American troops. Even more significant perhaps, the commanders of the American air force refused to follow the recommendation of the ground commanders that the aircraft fly and bomb going parallel to the enemy troops instead of perpendicular.

AUGUST-NOVEMBER 1944

August began with major organizational changes, including the shifting of many B-24 Liberator groups to B-17s and most of the P-38 groups to P-51s. In addition, some experiments in guided weaponry were attempted using B-17s packed with the explosive Torpex and radio controlled into some of the tougher German bunkers for V weapons and submarines. However, several of these "Aphrodite" bombers crashed in England, including one that claimed the life of Joe Kennedy Jr., older brother of the future president.

Early August saw good weather over German target areas and massive bomber formations dropped their loads on the German industrial targets, oil, aircraft production, with armament dumps and manufacturing being the top priorities. Now attacks were carried out regularly on ten or eleven targets in a single mission. On August 4, Anne Frank and her family, after two years of hiding in Amsterdam, were betrayed to the Gestapo and later deported. Only the father was to survive the war, but The diary of Anne Frank lived on to tell the tale of their suffering and bravery. On August 5th, more than a thousand heavies attacked 11 targets, while the next day another huge force bombed oil refineries and other targets, including the oil plant near Hamburg. The weather on both days was excellent.

AUGUST 4 MISSIONS

P51D MISSION 5

Defend B-17s from ME-163s

The first contact with Luftwaffe rocket fighters occurred on July 28, 1944, when 5 ME-163 Komets were encountered while they were up on trial flights. One week later, three 352nd Group P-51s escorting B-17s to Magdeburg were bounced by several Me-163s. The Komets dove from approximately 7,000 feet above the Mustangs and pressed their attack to nearly point-blank range. The Me-163s then zoomed up out of sight into the clear blue sky.

Your Mission

Since the first sightings of German rocket aircraft one week ago, you've been briefed to be on the alert for them. You and two other P-51Ds are to escort B-17s as they bomb an aircraft engine factory at Magdeburg. Remember that your primary mission is to protect the bombers. If you are attacked, do not stray too far from your "big friends".

Strategy

Five ME 163s are approaching you from the northeast. Dogfight the Me 163s as best you can. Once the bombers turn left after they drop their bombs the Me 163s will attack them. Stay close to the bombers and protect them. In turn, they will also protect you!

B-17 MISSION 4

Bomb Magdeburg Oil

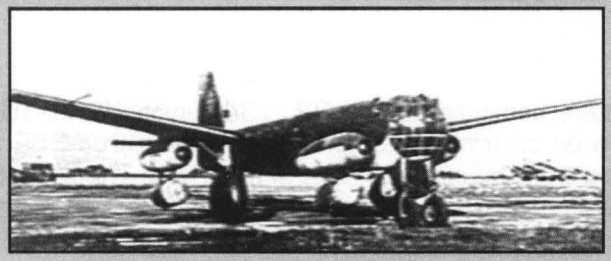
Synthetic fuel production was a crucial resource for the Nazi war machine. As such, installations involved in the refinement process were often the target of Allied bombing raids. Some of the worst flak and most intense air combat experienced by the Eighth Air Force pilots and crews occurred on missions where German oil was the objective.

The ME 163B Komet's introduction to combat service in July, 1944 gave the Luftwaffe a new, somewhat impractical, high altitude interceptor. As the first operational rocket fighter staffel, 1./JG 400 was pressed into service to help the Luftwaffe guard Germany's synthetic fuel factories from Magdeburg to Leuna.

Your Mission

You are flying in a formation of B-17s with orders to bomb the oil refinery at Magdeburg. Your P-51 escorts offer only limited protection, as enemy fighter defenses have been very active in this area. Also, Allied intelligence has reported enemy jets operating here.

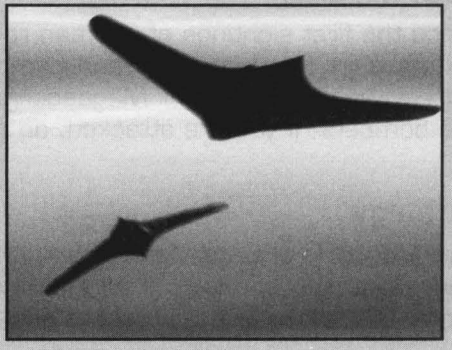
Some German Secret Weapons



The Ju 287 was one of the German jets.

The Me 263 never entered the war.

Hitler thought the Me 162 Volksjaeger (people's fighter) would be a devastating weapon. It did not turn out that way.



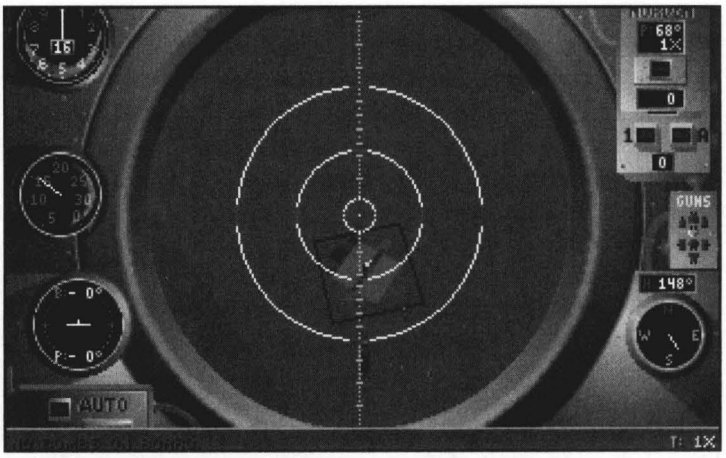
The Gotha 229 flying wing was perhaps the most advanced design of its day, but it never was able to fly in combat.

The Me 163 Komet did fly...

and so did the Me 262 jet, perhaps at one time Germany's best hope. None of Hitler's secret weapons was able to save him or his Reich.

Strategy

As you approach the target, the Bf 109s will tangle with your P-51 escorts. Line up on the target and use the timer to release your bombs. Me 262s will show up once you reach the target. Man your nose and tail guns to fend them off. Once you release your bombs, make sure you turn left with the rest of the group. Otherwise you'll be singled out by the enemy fighters and blown out of the sky.



Line up on the target and set the timer.

ME 163 MISSION 3

Attack a B-17 Formation

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Your Mission

Based at Quedlinburg airfield, south of Magdeburg, your squadron gets the scramble order to intercept American bombers approaching the oil refineries there. Unfortunately, a pair of Mustangs is closing on your airfield even as you jump into the cockpit of your Komet. Get airborne quickly and dispatch the P-51s. Then climb to an altitude of approximately 30,000 feet, where you can make a power-off glide toward your vectored intercept point with the bombers.

Strategy

Take care of the P-51s first, before making your climb to intercept the bombers. Remember to use your fuel and ammo conservatively and take care of the P-51s quickly. Then begin your climb to intercept the bombers. Use your speed to advantage against the bombers by making fast attack runs against them.

Col. Clarence Anderson was flying over Magdeburg when he spotted four bogeys. Attaching himself to the leader, he began a dogfight that he still remembers. "He turned out to be a fairly tough adversary. He made this hard turn, which caused me to overshoot him... you know, go past him. So I could see that this is not too good. I had wide open throttle, so I just pulled the airplane straight up as steep as I could, and he reversed his turn. Of course I was worried about my wingman now because he'd be behind me, and I told him to spin it off, get that guy out of there, but this guy's going after me. I pulled my airplane straight up and I could look out the left side and, you know, he was below me, couldn't quite get his nose up on me. He stalled just before I did, and that put us in a reverse situation where he's going down and now I'm chasing him. He pulled out and as I closed he made another one of these hard turns... Instead of overshooting and then pulling up again, I came back on the throttle. He was very, very good. He saw immediately what I was doing and he had his full power and turned around and pulled straight up thinking that I'd be slow. Well I came back in with the power and pulled up and just as he was going almost vertical I let a burst go right into the cockpit. The thing started smoking and just slowly rolled over. I came up right alongside of him. I could look right in the wheel well and see the grease and the rivets on the airplane, and he rolled over slowly and from thirty or thirty-two thousand feet he just went right straight into the ground."

RESISTANCE BUILDS

Intelligence gained by means of Ultra confirmed that the Allied bombing of oil and fuel sites was having the desired effect. Many operations were being curtailed and specific emergency crews were being organized to try to repair damage to the vital oil facilities.

By mid-August, the Allies had advanced to within 30 miles of Paris. Another landing in the Mediterranean placed 94,000 men and 11,000 vehicles in southern France in a single day. Meanwhile, in Poland, the citizens of Warsaw had revolted against the Germans, who began systematically killing Polish citizens by the tens of thousands, according to Himmler's direct orders. The Russians, though close to Warsaw, were unable to break through and refused to fly in supplies to the Polish insurrectionists. The Allies sent two supply missions, but each was only marginally successful, resulting in many planes lost and only a few of the many tons dropped actually falling into Polish partisan hands.

Meanwhile, the French police in Paris, who had been obeying the occupation government, turned to the side of the Resistance and open rebellion began on August 19. More and more of the German forces were captured or killed, and the Resistance swelled as more people joined and captured weapons and equipment were turned against the aggressors. By August 21, there were more than 7,000 armed partisans awaiting the Allied troops.

While these acts of resistance continued and German forces were in retreat all over Europe, the Gestapo was busy killing political prisoners, partisans, Jews, and anybody else they could catch, or so it seemed. They found many ways to murder people. Many were simply shot. Some were hanged. One popular form of killing was to lock a large group in a building and set fire to it. Any who escaped were shot. The killings continued with the usual level of Nazi brutality.

Maj. Preddy Gets Six

On the night of August 5th, 1944 Major George Preddy was winning big in a high stakes crap game and getting tanked in the process. He was already one of the VIII's top aces and was known as a dedicated fighter pilot and devastating shooter. His crew chief would say that if Preddy returned and his guns had been fired, then at least one Nazi plane had gone down.

Preddy reenacts his arrival.

The next day Preddy was up in his *Cripes A'Mighty 3rd*, the plane he made famous, feeling a little under the weather—and this time it wasn't the ubiquitous European cloud. Flying to a rendezvous with the bombers he was to escort, he threw up in his oxygen mask, and while he was cleaning up the mess, he and his wingman became separated from the rest of his group.

Whether it was anger or embarrassment that dictated what happened next, or just good opportunity, nobody knows, but within minutes, Preddy did what nobody else was able to accomplish in the ETO (European Theater of Operations). He shot down six enemy planes in one mission.

Spotting a formation of 30 Bf 109s, Preddy flew up to the tail-end Charlie and blasted him, moving on to the next in line. The first five planes went down like dominoes. Preddy's assessment was that they were probably new recruits with very little training. Such brand new pilots were required to stay in formation, and perhaps they never even knew they were under attack until it was too late. Preddy's shooting was very accurate.

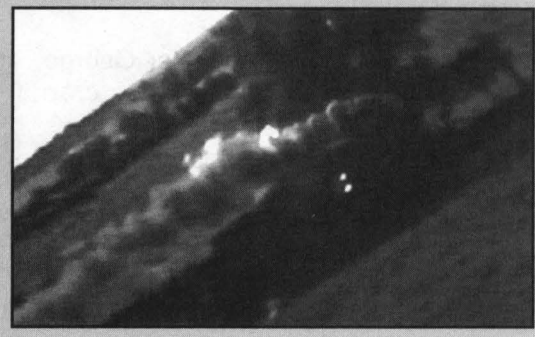
One of Preddy's six.

The sixth plane spun down in a dive and gave Preddy a fight, even scoring some hits on him. In the end, though, the result was the same. Preddy said, "That was the best part of the mission for me. The first five never had a chance—not one of them fired a shot at me—but the sixth gave me a real dogfight."

Exhausted from the mission, and probably even more from the previous night's excesses, Preddy arrived back at his base to a hero's welcome. The next day, the military made a promotional film in which Preddy reenacted some of the encounter while flying over the base.

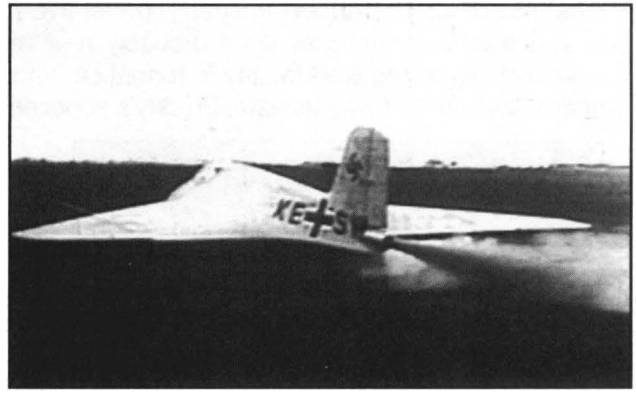
In Roumania, King Michael ordered Marshal Antonescu to cease hostilities with the Allies and engineer an armistice. Antonescu refused and was immediately arrested as were the German attachés. Following the capitulation of Roumania, Finland also sued for peace and abandoned Hitler.

Major Preddy was also a devastating marksman during the many ground strafing missions carried out by the fighters during this period. He blasted many trains and transport trucks with incredible accuracy as his gun camera footage shows.



On August 23, Churchill authorized the formation of a specifically Jewish fighting unit called the Jewish Brigade Group. Their flag was a Star of David on a white background with blue bars. In a telegram to Roosevelt, Churchill wrote, "...surely they of all other races have the right to strike at the Germans as a recognizable body." He added, "Indeed I think that the flying of this flag at the head of a combat unit would be a message to go all over the world."

THE KOMET



The first time an Me 163 rocket plane was reported to have attacked a bomber occurred on August 16. In two separate areas, Komets were seen by the bomber crews—one in the "wounded" *Outhouse Mouse*, a bomber that finished the war with 139 missions completed. *Outhouse Mouse* had fallen out of position after being hit, and was attacked by Komets. However, Lt. Col. John Murphy had spotted the Me 163s and had guessed correctly that the planes would attack the straggler. With his wingman, 1/Lt. Cyril Jones, he vectored in on the Komets, but arrived after they had made their pass at the bomber. They overshot the B-17 and slowed down, perhaps in order to make another pass. Jones found himself in a favorable position and was able to claim hits on the rocket plane, but blacked out trying to follow it in a dive. Murphy had spotted another of the Komets below him at 5,000 feet. He was able to dive in on it, out turn it, and blow it up with some well placed shots. Later, near Bohlen, more Komets made passes on the bombers, but without conclusive results. Although these were the first times they had attacked, the Komets soon became fairly common, though never numerous enough to be a great threat.

AUGUST 16 MISSIONS

ME 163 MISSION 2

Stop Attack on Leipzig

On August 16, 1944 the 359th FG escorted three boxes of B-17s to Leipzig. While flying at 27,000 feet, the bombers were intercepted by Me 163s of 1./JG 400. The Mustang escorts were mostly out of position to intercept the lead Komet, but the pilot of this aircraft overshot his intended target. Slowing down after his first pass, the German pilot unwittingly put himself into prime firing position for the P-51s. Two Me 163s were shot down on this occasion, while the others were engaged by the American fighters without loss to either side.

Your Mission

You are the leader of a flight of five Me 163s based at Brandis airfield. Your squadron has been ordered to intercept a formation of B-17s headed for Leipzig. Head west and climb to 33,000 feet, making a turn to the south upon reaching altitude. Glide to the vectored intercept point and make either a head-on or stern attack on the bombers. Your rocket fighters are armed with SG 500 rockets. A pair of FW 190s is flying top cover for you as you take off.

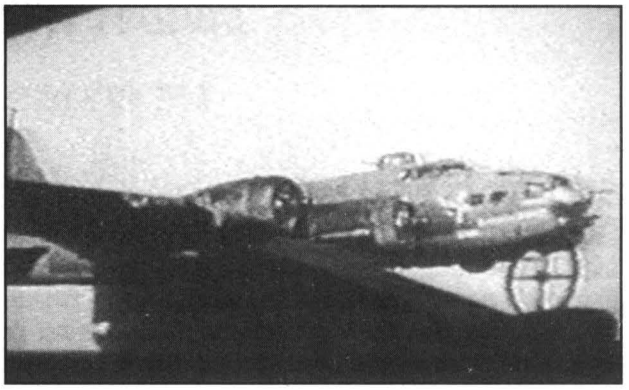
Strategy

Climb as quickly as possible and follow the way points carefully on the map. Otherwise, you'll miss the bombers. Remember to conserve your fuel and don't expect to shoot down all the bombers. As you make your trip home, expect to meet up with fighter resistance along the way.

Also on August 16, Hitler finally gave up on Normandy and ordered his troops to retreat. Decrypted messages gave the Allied commanders exact information about the proposed retreats, which might have allowed them to ambush the retreating troops if they hadn't been withdrawing so fast.

COUNTERMEASURES

The Germans had determined that they could gang several anti-aircraft guns together to get a shotgun effect from their flak bursts. Therefore, their 88 mm guns would be operated in groups of 12, 16, 18, or 24 guns. These would be operated from radar-controlled control



stations. Also, the more powerful 105 and 128 mm guns were also grouped. To make matters worse still, the Germans had been able to extend the range of these guns. Where previously they had been unable to shoot above about 26,000 feet, now they could top 30,000, leaving the bombers little refuge.

Some areas were very heavily defended. For instance, by November, the area around Liepzig had about 1,000 guns surrounding it, with a great many of them protecting the vital chemical and oil facilities at Merseburg—a target dreaded by the bomber crews in much the same way Schweinfurt had once been.

Several countermeasures were tried. The most effective was to use a combination of Carpet and window (chaff), but the application of window had to be done carefully, so that it looked like a bomber. Otherwise it wouldn't fool the radar. Also, the Germans had adapted a system that let a particular controller station that might be jammed, transfer its operation to another controller with a clearer image.

Although it wasn't specifically aimed at countering ground fire, another technological innovation was to have a significant effect on the performance of the Allied fighter effort. This was called MEW (Microwave-Early-Warning). Though its range was only 150 miles, this new mobile radar gave accurate information on the direction and altitude of enemy aircraft and allowed ground controllers to successfully vector fighters to the enemy. This became a significant factor in allowing the Allies to maintain their air superiority. Before MEW, many pilots never saw any action. With the new system, it was possible to get the planes where they were needed with greater frequency. In addition it was effective in warning both bombers and fighters of impending attack by enemy forces, hence the name "Early Warning."

Along with the strategic bombing, which proceeded to devastate the industrial areas of Germany, more and more bombers were used in support of the invading forces. It was often necessary to bomb bridges and other transportation to prevent the German Army from getting reinforcements. Also, many bombers were being pressed into service to support the incredible supply needs of the rapidly advancing Allied forces. For 11 days during the early part of the invasion, the 96th Wing ferried in 2,117,310 gallons of fuel alone, and more almost 10,000 tons of emergency supplies of all kinds were flown in on B-24s during this period.

Most supply missions were relatively safe, but on at least two occasions, they could be highly dangerous. In one case, on September 18, more than 250 bombers were sent out to drop supplies for the forces advancing over the Rhine. After surviving several operational snafus, including the orders for two of the wings being mixed up, they were able to drop their supplies with varying degrees of effectiveness. However, they met with intense ground fire and at least seven Liberators were shot down and others were damaged.

On the same day, another force of bombers went to drop supplies to the Polish rebels. While the Russians were still unwilling to intercede, even though they were practically poised on the doorstep

of Warsaw, the Americans were able to drop supplies to the Polish partisans.

On August 18, Col. Hubert Zemke, one of the 4th's leading pilots, took his new command, the new 479th, on a strafing run over the Nancy/Essey airfields where they destroyed more than 40 German planes on the ground.

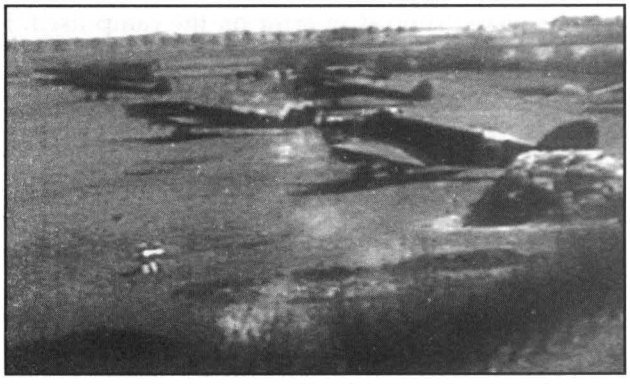
Fighting erupted in the Paris streets.

On August 24, French armored troops led by Colonel Pierre Billotte, entered Paris and the liberation of the French capital began. There were still fierce battles against the German strongholds, but the tide of jubilation swept through the city, the churchbells pealed and the people embraced their liberators with food, wine, kisses, flowers, and overwhelming gratitude.

On August 29th, eight P-47s of the 78th encountered a new aircraft flying at low altitude. Thinking it to be a B-26 Marauder at first, they were going to ignore it. But they noticed that its speed was far greater than the bomber could attain and so dove down to investigate. Reaching nearly 450 mph in a 45-degree dive, Major Joe Myers led the group down toward unidentified craft. The pilots ditched the plane, which was destroyed by P-47 strafing on the ground. This was the first Me 262 destroyed by Allied planes.

Since the liberation of Paris, Allied forces had continued to expand their territories in France, freeing more and more of the country from German occupation. By the end of the month, American forces were within 60 miles of Germany.

The battle for France was not over yet, however, as Hitler determined to hold as much of western Europe as he could and to deny the use of important ports to the Allies.



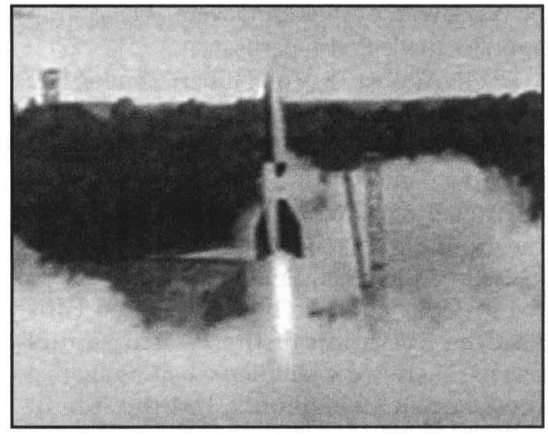
On a strafing run, puffs of dust indicate where bullets are hitting.

Ground strafing missions continued with intensity in early September. On the 1st alone 138 planes claimed 94 locomotives destroyed and more damaged, plus hundreds of rolling stock and other vehicles, including 15 tanks. On the 5th, two groups claimed 143 parked German aircraft and 90 more damaged in successful raids on lightly defended Luftwaffe airfields.

On September 7, the British announced that the danger from the V-1 rockets had been eliminated. Ironically, on the next morning, the first two V-2 rockets fell in the outskirts of

London, killing three people. However, the details of the V-2 were kept secret for nearly a month.

On September 9, the Russians took over Bulgaria and set up a new government in Sofia. On the next day, the first Allied soldiers entered Germany—an American named Charles D. Hiller with a Belgian, Henri Souvée.



Launching a V-2.

On September 11th, and for two days after, the bombers went after the German oil fields again, meeting the first really determined resistance from the Luftwaffe since late in May. On the first day, the Germans flew more than 400 sorties and had some success against the bombers. However, they were believed to have lost as many as 116 fighters while downing only 15 Mustangs. On the succeeding days, they were able to put up fewer fighters so that by the third day, they flew only about 100 to 150 sorties. The ratio of fighters destroyed favored the Americans seven to one. With such odds, it was obvious to the more experienced Luftwaffe pilots that there was little hope of continuing at this rate. Most pilots were probably unaware of such statistics however.

Stalin finally agreed to send supplies in support of the partisans fighting for control of Warsaw and to allow the Allies to do so, too. On September 13, the first such mission was flown by a Polish pilot for the Red Army. Meanwhile, a daylight bombing mission attacked synthetic oil sites at Blechhammer and Monowitz, very near the Auschwitz concentration camp. Several bombs were dropped in error on the camp itself, killing 15 SS men and wounding another 28. Several prisoners and civilians were also killed. However, these bombings had a salutary effect on the prisoners, who, for the first time, saw their hopes of survival rise and watched their captors' hopes fade. One Jewish slave-laborer, Shalom Lindenbaum, who was at the Monowitz factory wrote later, "We ceased to work, and the German soldiers and civilians ran to the shelters. Most of us didn't. So probably, we expressed our superiority feeling, and a kind of revenge. We had nothing to lose, only expected to enjoy the destruction of the big factory which we were building for the IG Farben Industrie. It was naturally so. This happy feeling didn't change after the Americans indeed, began to bomb, and obviously we had casualties too—wounded and dead. How beautiful was it to see squadron after squadron burst from the sky, drop bombs, destroy the buildings, and kill also members of the *Herrenvolk*."

On the same day in Hanford, California, the final step in the activation of an atomic pile was begun under the guidance of the Italian physicist, Enrico Fermi. This was a crucial step in the development of the atomic bomb. Less than a week later, two bomber crewmen were taken to Los Alamos, wearing emblems of the Corps of Engineers where they were briefed on the potential hazards of dropping an atomic bomb whose strength was estimated to be at least the equivalent of 20,000 tons of TNT. Robert Oppenheimer, who was in charge of the project, told pilot Paul Tibbets, "The shock waves from the detonation could crush your plane. I am afraid that I can give you no guarantee that you will survive." Meanwhile, a technician named David

Greenglass had just stolen top secret blueprints, which he later sold to the Russians for only a few hundred dollars.

In mid-September, the Allies mounted an offensive designed to outflank the Siegfried Line and gain ground on the northern bank Dutch Rhine. However, heavy anti-aircraft fire was hampering the operations, preventing troops and supplies from being delivered safely. So, on September 17th, about 200 P-47s went on a "flak busting" mission, which meant that they had to act as bait for the gun emplacements. Once the ground fire began, some of the Thunderbolts would swoop down to deliver bombs and strafe the guns. In this way, they were able to put all but two of the AA batteries out of commission before the C-4 transports arrived.

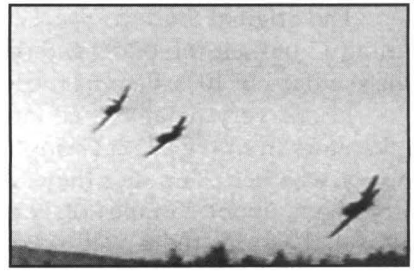
The next day, however, on a similar mission, even heavier flak was encountered, causing the loss of many planes and their pilots. The renowned 56th Group alone lost 16 planes out of 39 sent out. Part of the problem was heavy weather and low haze that prevented the fighters from finding the gun emplacements while they remained visible to the gunners.

On successive days, the American fighters were largely effective at keeping the Luftwaffe away from the Allied transport and supply aircraft. In several encounters, they out-fought the Germans by substantial margins, though other encounters were more even. On the 21st, however, the Luftwaffe was able to gain the upper hand as weather grounded most of the American fighter groups. Only two groups were able to enter the combat area, and these had their hands full.

As the Nazis retreated, they emptied their concentration camps. Some prisoners were taken from their barracks as if being evacuated, only to be shot. Others were deported to Auschwitz. One group was forced to participate in a bizarre and sick film where they were shown in various settings like a library, swimming in a pool, dancing, and at work in various normal occupations. Juxtaposed with these images were pictures of German soldiers wounded at the front. Commentary for this film, titled *The Führer Donates a Town to Jews*, said, "While the Jews in Theresienstadt enjoy their coffee and cakes and dance, our soldiers bear the brunt of this terrible war, suffering death and deprivation in defence of the homeland." Almost all of the Jews who participated in this travesty were killed later at Auschwitz. (This film was made earlier in the war.)

On September 23rd, fighters again attacked the flak batteries in an area over Arnhem that was being used for dropping supplies. However, in the end the German ground forces proved too strong, and the attempted breakthrough was a failure. Though the fighters had performed well, they had also lost 73; 45 of them were Thunderbolts.

Warsaw finally fell completely into German hands again on September 26, and the reprisals were as vicious as had been feared. While 15,000 resistance fighters had been killed in the fighting, and 10,000 Germans, the reprisals during and after the fighting would claim as many as 200,000 Polish civilians.

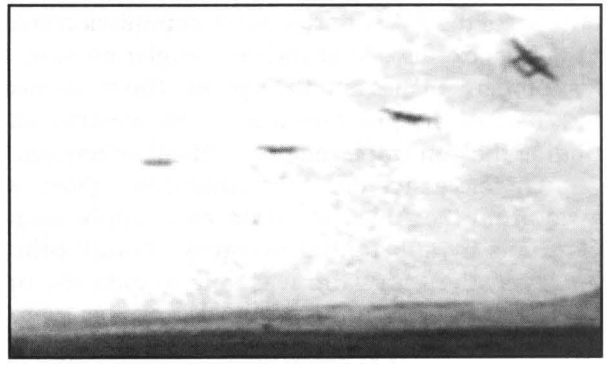


Meanwhile, Hitler was determined to defend every inch of German soil, and had enacted a conscription decree that made every able-bodied man between the ages of 16 and 60 a part of the "People's Army." However, Hitler was fighting his own health battles. He was described by one General Nikolaus von Vormann as "a tired, broken man...who greeted me, then shuffled over to a chair, his

A tired, broken man...

shoulders drooping, and asked me to sit down." Vormann added, "He spoke so softly and hesitantly, it was hard to understand him. His hands trembled so much he had to grip them between his knees."

The days of the P-38 Lightning were almost done, at least as far as the VIII Fighter Command was concerned. Although it had performed well, and its extended range had been useful, it had also suffered higher loss rates than the other fighters and had been plagued with mechanical failures. However, it went out on a good note as the 479th, with 31 P-38s and 12 P-51s, claimed 29 Bf 109s in an encounter on September 26th. Two days later, the P-38 saw its last combat.



It was the swan song of the P-38 Lightning.

Another significant development was the establishment of the famed Me 262 *gruppe*, Kommando Nowotny, which was named after its leader, the German ace Major Walter Nowotny.

Meanwhile, the infamous Sturmgruppe had developed some effective tactics, and one of the new weapons in the German arsenal was the so-called "heavy fighter," a Focke Wulf 190 with extra armor and bullet-proof glass that protected the pilot during a rear assault. With only a small target to hit, and with the pilot protected, the tail gunner of a B-17 stood much less chance of shooting down one of these planes.

A new test for the Me 262.

The original *Sturmgruppe*, IV/J.G. 3, had been ambushed by Mustangs on their home field, losing 15 of their top pilots and several planes. II/J.G. 4, armed with the reinforced FW 190s and the standard Bf 109s, became the leading bomber killers after that incident.

In one very notable encounter on September 27th, they were able to fall upon a group of Liberators from the 455th Group that had gotten out of formation due to a navigational error in heavy weather. Thinking they were bombing Kassel, they had, in fact, dropped bombs near Gottingen, about 20 miles off target. Then they followed the return plan as if they were over Kassel. This put them well separated from the main bomber stream—prime candidates for interception as the wily ground controllers were always on the lookout for strays.

Within minutes, 90 FW 190s and Bf 109s had blasted 25 of the bombers from the skies, damaging many more. This was the largest loss suffered by a single VIII Bomber Command group in one encounter.

SEPTEMBER 27 MISSIONS

P51D MISSION 3

Escort B-17s to Kassel

On September 27, 1944 the 361st Fighter Group was escorting the Third Force to hit targets at Kassel, Germany. As the P-51s flew under the bombers, a force of approximately 40 FW 190s bounced the entire formation from above and behind. In the dogfights that ensued, Lt. William Beyer, leading Red Flight, shot down 5 of the FWs. When the battle was over, Beyers squadron had downed 17 FW 190s while losing only one of their own.

Your Mission

You and your wingmen are faced with a double-edged challenge: save yourselves and save the bombers. The attack by the Focke-Wulfs is unavoidable, but you can counter their bounce with an attack of your own. Can you join Lt. Beyer in the elite five-in-a-day club?

Strategy

As you begin the mission, you'll get bounced right away by a group of FW 190s. The priority, though, is to deal with the FW 190s attacking the bombers. Try to protect the bombers as best you can and refer to the map often. This will help you keep track of the positions of the enemy fighters. Remember to stick with the bombers.

By mid-October, the Russians were retaking Hungary, Greece had been liberated, and the Americans were besieging Aachen, in the western part of Germany. In Yugoslavia, on October 14, the Russians began an assault on Belgrade, which culminated in the defeat of the Germans within 48 hours. Also on October 14, two of Hitler's generals visited Rommel at his home where he was recovering from his injuries. They offered him a choice of suicide by cyanide pill or public trial in conjunction with the plot against Hitler. He chose the pill.

On October 16, a pro-German government was set up in Hungary, and Adolf Eichmann returned within 24 hours to demand that 50,000 Jews march by foot to Germany to be put to slave labor. He told the Jewish leader, Rudolf Kastner, "You see, I am back again. You forgot Hungary is still in the shadow of the Reich. My arms are long and I can reach the Jews of Budapest as well." Thousands of Jews, men, women, and children were marched from the city and forced to dig anti-tank ditches as the Russians approached from the southeast. Thousands were shot as they marched. At the same time, the Red Army was only 50 miles from Hitler's "Wolf's Lair" headquarters in Rastenburg.

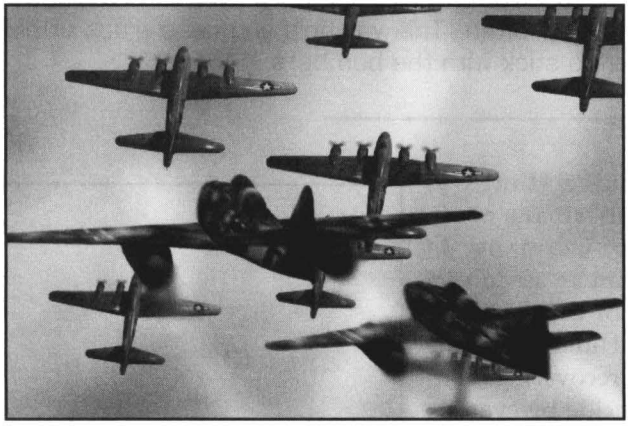
After a seven-day siege, Aachen fell to the Americans—the first German city to fall into Allied hands.

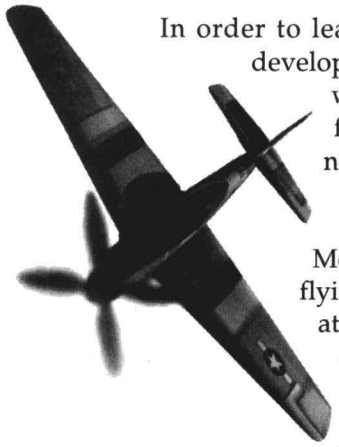
One major administrative change that took place starting on October 10th was that the VIII Fighter Command fighter wings were to become part of the Bomber Command, although they remained in many ways separate. This was a step in the direction of creating a unified air force, however.

On October 6, the J.G. 4 *Sturmgruppe* carried off a successful surprise attack on a high formation just at the moment it was turning into its bomb run. Hidden in high clouds, they were able to swoop down upon the bombers before help could arrive, destroying eleven of them before escort fighters arrived to exact some measure of revenge.

The month of October produced the fewest sightings of Luftwaffe aircraft for a year. Only 72 were seen. However, there were increasing sightings of the new German jets. On October 6, Lt. Mueller in a P-47 was able to bounce an Me 262 from altitude and shoot it down. On the next day 25 Me 262s were seen and three jets were shot down, two as they were taking off.

It was becoming clear that the Me 262, while it enjoyed far superior speed, had some weaknesses, and the American pilots began to find ways to exploit them. In particular, the jets were vulnerable when taking off or landing, and they could be attacked successfully from above where the slower American planes could gain speed and perhaps the element of surprise. Also, with only a few 10,000-foot runways available, the Me 262 could not operate from many fields. The jets didn't have the maneuverability of the Thunderbolts and Mustangs. In many cases the German pilots' inexperience would allow the slower American planes the advantage, on which they often capitalized. Despite the fact that the German super-planes were not invulnerable, they still posed a serious threat to the bombers, one that the fighters might not be able to counter effectively if the jets were to be seen in greater numbers.

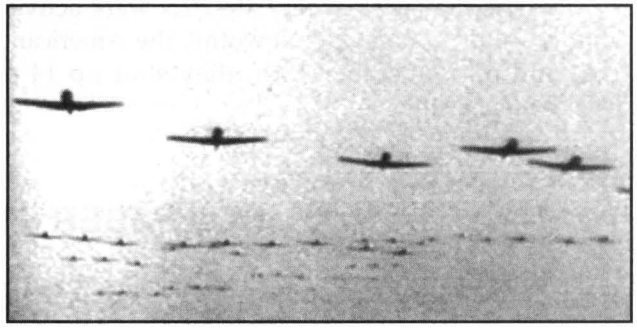




In order to learn how to defeat the jets, several Meteor Is, the experimental jet developed by the British, were used to develop anti-jet tactics. Mock attacks were carried out on B-24s with P-47 escorts and the results analyzed to find ways to counter the threat of German jets. However, the Meteor never was entered into combat.

Two of the VIII FC's top leaders were grounded about this time. Col. Zemke lost a wing in heavy turbulence and became a POW. Meanwhile, Don Blakeslee returned from a tour of the States to resume flying and was grounded. Whereas the normal tour for a fighter pilot was at this point 300 hours, Blakeslee was conservatively beyond 1,000 hours and had doctored his flying records to prevent being grounded. But finally, he was put behind a desk.

Although the Luftwaffe was very quiet during October, many felt that they were getting ready for a large-scale attack on the Allies somewhere. Intelligence was aware that overall fighter production was still high, despite the devastation caused by the strategic bombing effort. On November 2nd, this theory was proved correct as a force of almost 650 B-17s with a huge escort of more than 400 fighters went after the heavily defended oil refineries at Merseburg. Over a period of 40 minutes, the Americans were able to shoot down an estimated 138 of the 300-400 German fighters that were sent against the bombers. Against that, the Luftwaffe only downed 26 bombers and perhaps 8 P-51s.



Despite these encouraging statistics, General Doolittle was not unduly optimistic. The Luftwaffe had been producing record numbers of fighters, as many as 3,000 in the month of September. Moreover, several of the Luftwaffe's fighter groups had not been airborne on the 2nd, probably because of weather difficulties. Still more worrisome was the increasing frequency of encounters with the Me 163 and the Me 262. It appeared that the Germans might be able to gain ground on the Allies despite everything that was happening to them. There was no chance of an American jet appearing on the scene for at least nine months, and, with only one Meteor squadron activated, the British had serious problems producing more.

Doolittle was worried about losing 100 bombers in a single raid, while Galland's plan was to amass 2,000 fighters and shoot down 1,000 in a single mission! His desire was to see fighter escorts increased from a ratio of 1 for every 2 bombers until it reached 2 to 1.

On November 2, another 50,000 Jews were driven on foot from Budapest and forced to walk amid beatings and shootings to Germany. At least 10,000 died on the march. A

thousand of them were saved by the Swedish diplomat Raoul Wallenberg whose intervention had previously saved several thousand by granting them Swedish papers.

On November 6th, one famous ace—who has become something of a celebrity in modern days—had a memorable encounter with Me 262s, probably of Kommando Nowotny. On the first pass, Captain Charles "Chuck" Yeager was able to score a few hits on one of them, but was unable to keep up with them. However, flying low, around 5,000 feet, he met them again... "We were flying along in overcast which was very thin and the edge of it was over to the right, altitude about 5,000 feet. I went under it and flew along for a minute or two and I met them head-on again only they were now flying at about 2,000 feet. I split-s'd on the leader and they all separated. I fired a high deflection burst from above on the leader, got behind him and was pulling 75 in hg and indicating 430 mph. I fired two or three bursts and got hits on the fuselage and wings from 300 yards, then he pulled away and went into the haze where I lost him."

Later on the same mission, Yeager spotted a lone 262 approaching a runway and was able to shoot him down at low altitude.

Two days later, Kommando Nowotny was to lose two jets to one P-51 in heavy fighting. One of the pilots lost was Nowotny himself, one of only eight pilots decorated with Germany's highest honors—the Knight's Cross with Oak Leaves, Swords, and Diamonds. Soon after that the unit was withdrawn. It had only been operational for six weeks. It had shot down 22 Allied planes while losing 26 to all causes. Inexperience and lack of training were probably responsible for the unimpressive record of this fighter group, despite their superior aircraft.

Despite the fact that few Me 262s were active in the fighting for several weeks after the withdrawal of Kommando Nowotny, the American fighter pilots chased down any they could find, and on November 18th, they shot up 14 of the jets on an airfield at the Lechfeld development center.

NOVEMBER 6 MISSION

ME 262 MISSION 5

Patrol Near Osnabruck

On November 6, 1944, Captain Charles "Chuck" Yeager of the 357th FG had an encounter with Me 262s in the skies over over Germany. As Yeager recounted:

"I was leading Cement White Flight when north of Osnabruck we spotted three Me 262s going 180 degrees to us at about 2 o'clock low. We were at about 10,000 ft. and I and my flight turned to the right and headed the last man off. I got a hit or two on him before he pulled away. They did not take any evasive action, but seemed to depend on their superior speed. They pulled out of range in the haze.

"I flew along for a minute or two and I met them head-on again, only they were now flying at about 2000 ft. I split-s'd on the leader and they all separated. I fired a high deflection burst from above on the leader, got behind him and was indicating 430 mph. I

fired two or three bursts and got hits on the fuselage and wings from 300 yards, then he pulled away and went into the haze where I lost him."

Yeager's experience with these Me 262s is indicative of how difficult it was for Allied pilots to successfully engage the German jets in an open dogfight.

Your Mission

You are leading a flight of three Me 262s on an advanced training mission north of Osnabruck. Be alert for the ever increasing presence of American fighters on sweep missions. Once you've completed your patrol, return to your home base at Osnabruck.

Strategy

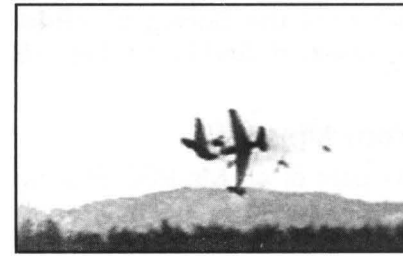
Before you begin the mission, look at the map carefully. You'll see the outer blue edges of the enemy aircraft icon sticking out from the edges of your own icon. As you begin the mission, the P-51s are high above and ready to bounce you. Outrun the P-51s by diving and turning, then maneuver your aircraft in for the attack against them. Work quickly, because several P-47s are making their way to your airfield from the west. Get to the airfield as quickly as possible and prevent their attack.

MORE STRATEGIC BOMBING

The Germans tried more all-out attacks on the American bombers. On November 21st they sent up significant forces, but were beaten badly, partly due to an error on the part of the ground controllers. However, the Americans claimed 73 against 2 losses. One pilot praised his K-14 gunsight and his G-suit for giving him the advantage when fighting against numerous enemy planes. Again on the 26th and 27th the Germans attempted large-scale attacks. On the 27th, they sent 750 fighter sorties, a record that was not to be surpassed for the rest of the war.

Unfortunately for the Luftwaffe, though it still had planes, it was desperately short on two critical elements—oil/fuel and trained pilots. Many of the hundreds of planes shot down in these three raids were flown by novices with only a few hours training. These pilots would fly in formation and would rarely break even when attacked. The much more experienced Americans would shoot them down with little effort. These large-scale attacks signaled a sense of desperation on the part of the Germans as they saw their position erode steadily on all fronts.

An example of the American bravado and self-confidence is well illustrated by the case of Ray Wetmore, an experienced fighter ace, who followed a force of 120 enemy fighters for hundreds of miles while calling for more Mustangs to join him. When none arrived, he and his wingman decided to bounce the formation themselves! That they lived to tell about it must in part be due to the lack of trained pilots.



FW 190 MISSION 3

Scramble from Brandis

American fighter-bomber sweeps sent ahead of a bombing raid were often effective in catching German aircraft on the ground as they prepared to take off for interception missions. Flying low to avoid radar detection, the P-51 Mustangs and P-38 Lightnings used for this purpose were capable of causing considerable damage with just a few well placed bombs. These missions became even more effective once the Allies had secured numerous French airfields from which they could launch the fighters, carrying less fuel and greater bomb loads.

Your Mission

You and three other FW 190s are ready to take off from Brandis airfield, east of Leuna. Your primary mission is to intercept American bombers heading for the oil refinery at Leuna, about 27 miles west of your current position. As you start your engines, you see an ominous sight: five bomb-laden P-51s heading straight for your field. Get airborne as fast as you can to defend your airfield, but don't forget your primary mission.

Strategy

As you take off, attack and destroy the P-51s quickly. Once they're destroyed climb and intercept the bombers. Your navigation must be accurate in this mission. Otherwise you'll miss the bombers! Use the map often to see your relative position and the location of your way point.

ME 262 MISSION 2

Attack Roye Airfield

When the Me 262 was originally demonstrated to Hitler in November, 1943, he ordered that it be used as a fast bomber. Although this revolutionary aircraft could have been put into service much sooner as an interceptor (the role for which it was designed), the Führer's requested modifications caused the production of the 262 to be delayed. It was not until the Spring of 1944 that the first Me 262 Sturnvögel bomber units were established. And in October, 1944, Adolf Galland finally got his own fighter unit of 262s.

Your Mission

As part of an Me 262 Sturmvögel unit, you are to attack the Allied-held airfield at Roye. You'll be leading a schwarm of four 262s, each armed with two 551 lb. bombs. Be alert for enemy fighter cover in the area.

Strategy

As you approach the target, you'll have to engage the P-47s flying top cover. Your aircraft will evade rather than engage the enemy fighters. Once the P-47s are destroyed, begin your bombing run against the airfield. Be on the look out for more P-47s that show up while you're on the bombing run. Don't hang around the airfield and dogfight the P-47s while still in range of the anti-aircraft guns. Once the P-47s are destroyed fly to your home field. Just as you reach home, get ready for a surprise attack by a couple of P-51s. If your plane is badly damaged, fly low around your home field and let the anti-aircraft guns knock the the enemy fighters out of the sky. If you have no choice but to land, try to park your plane between the two hangar buildings. This will provide protection until the anti-aircraft guns can eliminate the threat.

ME 163 KOMET MISSION 1

Scramble from Bad Z.

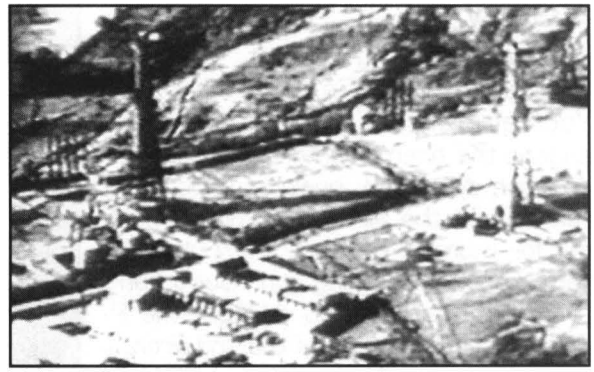
Much of the initial flight testing for the Me 163 was done at Bad Zwischenahn. This airfield would have been an ideal launching point for the Komet to intercept incoming Allied bombing raids. However, after the Allied invasion of Normandy, the risk of ground attack from American fighter-bombers eventually forced the Luftwaffe to curtail operation of advanced aircraft in this area.

Your Mission

Ground control reports several small formations of inbound enemy aircraft at low altitude. Most likely Allied P-47s, these fighters are either on a fighter sweep ahead of a bombing raid, or they're on an attack mission for the specific purpose of destroying German aircraft on the ground. Either way, your orders are to get airborne fast, avoid their fire, and try to turn the tables on the attacking aircraft. There are other Luftwaffe aircraft operating in this area, so choose your aerial targets carefully.

Strategy

Get off the ground as quickly as possible and use your fuel sparingly. The first pair of P-47s is impossible to hit before they bomb, so don't worry about it. Be careful not to run your plane into the ground, which is very easy to do in this mission since most of the action happens very close to the deck. The second group of P-47s is approaching from the north and will stick around your airfield to strafe after they complete their bombing run.



The vital Ploesti oil fields.

Oil and fuel were fast becoming a rarity in Germany. The damage caused by the Allied bombers—where by November more than half the oil refineries and synthetic oil production facilities were out of business either temporarily or "indefinitely"—and the loss of the vital Ploesti fields caused fuel shortages continued to mount. Despite the devastation caused at the oil industry targets, repairs were rapid on the bombed-out plants, and secret facilities were being built out of sight of Allied intelligence. However, the Allies were regularly decrypting both German and Japanese transmissions, and several messages sent from Japanese ambassadors in Germany indicated the state of the oil crisis and the existence of underground facilities that would not be completed until March. However, because the Germans were able to repair their bombed-out factories with amazing speed, it was necessary to return to many of the targets again and again. And the oil sites were particularly heavily defended with flak batteries. This made the cost of denying oil to the enemy a high one.

As winter approached it became clear that the war would not be won in 1944. The Allied commanders prepared themselves to enter yet another year at war. Weather prevented many missions from taking off, and the number of sorties flown in October and November fell off. However, experiments were on-going in an attempt to find reliable and accurate ways to bomb through cloud cover and smoke screens. One method used a transparent grid over the area map that allowed calculation of effective bomb release positions from landmarks that might be identified outside the area of low visibility. Other improvements were continuing on radar, and even the Norden sight received some modifications. Some of these changes were first created by men in the field, whose improvements often became standard equipment. An electric bomb release that eliminated the possibility of last-minute fumbling with the bomb bay levers was one such innovation, as was the grid bombing system.

Another improvement was an increase in the capacity of the drop tank for the gas-hungry P-47s, extending their range still further.

On November 25, a V-2 rocket hit a Woolworth's store and killed 160 shoppers. On that same day, the last gas chambers at Auschwitz were dismantled as the Germans were frantically trying to hide the evidence of their crimes. Of course the remaining Jews who had been forced to drag bodies to the crematoria were murdered as well. One of them, Chaim Herman, had written only weeks previously to his family in France: "I am going away calmly, knowing that you are alive, and our enemy is broken."

In December the weather was again the enemy. In fact, this was turning out to be an even cloudier and heavier winter than the last two winters had been. Missions were able to achieve visual bombing only on the 12th and the 16th.

It was under this cover of cloud that von Rundstedt launched his last-ditch attack on the Allied lines in the Ardennes. This was Hitler's somewhat demented attempt to wrest the

> **"You can't extract enthusiasm and self-sacrifice like something tangible, and bottle and preserve them. They are generated just once in the course of a revolution, and will gradually die away. The greyness of day and the conveniences of life will then take hold on men again and turn them into solid citizens in grey flannel suits."**
>
> **—Adolf Hitler, December 12, 1944.**

offensive back from the Allies. Though repeatedly advised that they were in no position to accomplish all the Führer's objectives, Hitler was completely intractable. He had been securing tank divisions and troops at the expense of other fronts for months, secretly planning this mass offensive against a relatively weak area of the Allied line. For once, the usually reliable Ultra decoding had failed to produce sufficient warning, and the Allies were taken by surprise.

The Nazis were attempting to cut a path through the Allied territory, splitting the American First and Third armies and taking control of one of the main Allied ports of supply. The timing of this offensive was coordinated with predicted bad weather and could not have come at a better time from the German point of view. The few planes that were able to get airborne on the 18th and 19th were forced to land at other fields. The air superiority of the Allies could not have a great effect on this area of conflict in its early stages.

As part of the plan, called Operation Autumn Mist, one of Hitler's more resourceful lieutenants, Otto Skorzeny, led a troop of English-speaking Germans disguised as American soldiers. With captured uniforms and vehicles, they set out to disrupt communications and transport. They were successful at first, and even after some had been captured and the ruse was penetrated, a massive wave of suspicion enveloped the ground forces causing soldiers to be accosted repeatedly and be forced to tell who won the World Series or what was the capital city of Illinois, or even who was Betty Grable's husband.

At first the more than a quarter million German troops made fast advances against only about 80,000 Americans. In one case, they made it to within a mile of a major fuel dump with three million gallons of gas. This was the most sorely needed commodity the German army sought, but they were unable to get that vital cache, and were often bogged down as supplies of oil and gas were so low.

One of the more notorious events of the war took place during the battle on December 17th. The 1st S.S. Panzer division headed by Colonel Jochen Peiper rounded up 72 American prisoners and shot them in cold blood. When about a dozen of them escaped to a nearby movie theater, the Nazis set fire to the theater and shot the prisoners as they escaped. This was an infamous act, and became well publicized, serving as a focus for renewed effort on the part

of the incensed American troops. However, this was by no means a completely unusual occurrence, though the scale of it might have been larger than usual. Even the American and other Allied soldiers had been known to execute prisoners on the field of battle.

The Americans held out at the crucial crossroads village of Bastogne, where, when ordered to surrender, the American commander, General A. C. McAuliff responded curtly, "NUTS!" When asked for a translation, the reply was almost as succinct: "Go to hell!"

In the race to bring reinforcements to the aid of Bastogne, the Americans won, barely, and the tide of the battle turned against the Germans, though Hitler would hear nothing of it, even insisting that they start another offensive operation in the Alsace region.

At this point, Hitler was suffering from visible nervous tics and twitches, and walked with a decided drag to one leg. However, he was completely lost in his own delusions of invincibility and refused to entertain the notion of defeat. He still exhorted his commanders to hold on and defeat the enemy, believing, apparently, that if Germany simply held off the attackers, she would witness the uneasy coalition of British, American, and Russian governments dissolve. It is apparent that he misunderstood that, whatever the differences of philosophies or economics that governed these countries, their hatred for his Reich was much greater.

The vast superiority of the Allied air forces was not able to be much of a factor during the first days of the Autumn Mist campaign, but by December 23rd, the weather was showing signs of clearing. With the help of MEW, several forces of fighters were vectored against enemy aircraft. In one case, three groups of P-47s encountered two large formations of FW 190s. While two groups attacked, the third formed itself to look like a German *staffel* and was able to get close to the enemy before being discovered. The dogfights lasted 45 minutes at the end of which the Americans claimed 37 against only 4 Thunderbolts, including the downing of the Luftwaffe ace Heinz Bartels with 94 victories to his credit.

Because the weather had kept the bombers grounded for most of December, Allied intelligence was quick to react when the opportunity arose. Based on predictions of good weather on the next day, the order came through to send every available aircraft toward the Reich's airfields and supply routes in the vicinity of the on-going battle in the Ardennes.

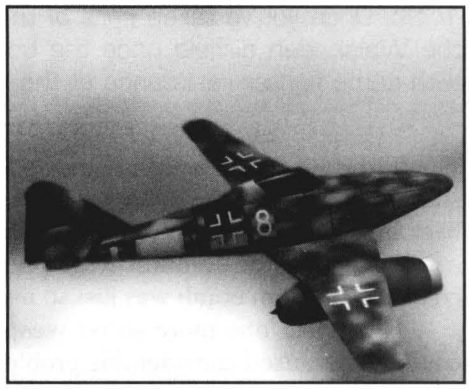
The response from the relatively idle bomber crews was a tremendous force. The Eight Air Force alone sent out 2,034 bombers while the Ninth Air Force and the RAF contributed another 500. Although the visibility was far from perfect, this massive assault made life hell on the Luftwaffe and the supply trucks and trains servicing the German front.

One significant loss was Brigadier General Fred Castle who saved most of the crew of a stricken bomber at the cost of his own life.

One truly remarkable incident involved a B-17 of the 467th. The pilot had given the bail-out order after one of the Fort's engines had been set on fire. Fearing that the wing would burn through, the pilot gave the order and bailed out himself. However, none of the crew received the order and the first they knew about the situation was when the navigator noticed that nobody

was flying the plane. Setting the plane on autopilot to cross the Channel, the bombardier and crew then bailed out over France. The bomber was later discovered comfortably nestled in a Welsh marsh in England. It had run out of fuel and performed a perfect belly landing without any human assistance.

Another notable event took place on the day before Christmas. For the first time, Hitler's erroneous, if persistent, dream for the Me 262 was realized as the "Blitz Bombers" attacked several factories under Allied control as well as transportation targets supplying the American troops.



DECEMBER 24, 1944 MISSION

P51D MISSION 1

Escort raid on Frankfurt

On December 24, 1944, the Allies launched what was to be the largest air strike of the war. 1,884 American bombers, escorted by 803 fighters, dropped more than 10 million pounds of bombs on airfields and communication centers in western Germany. 502 RAF bombers combined with the whole Ninth Air Force bomber command attacked targets in the Ruhr Valley. Response by the Luftwaffe was strong, however 75 German aircraft were lost to Allied fighters, 70 of these being claimed by Eighth Air Force pilots.

Once the heavies had completed their bombing runs, the fighters were able to drop to the deck to hit targets of opportunity. These targets included rail and road traffic, as well as enemy aircraft both in the air and on the ground.

Your Mission

You and your wingman are flying escort for a formation of B-17s en route to bomb the railway center at Frankfurt. Guard your bombers against attack by German fighters. Some of the enemy planes may be carrying air-to-air rockets, making it imperative for you to intercept each group as quickly as possible.

There may be an opportunity for you to bounce enemy aircraft operating from Weisbaden airfield on your way home.

Strategy

As you escort the bombers to the target, enemy fighters approach from opposite directions. The fighters approaching from the east are Bf 109s while the fighters approaching from the southwest are FW 190s. Go for the FW 190s first and then the Bf

109s. Once you've taken care of the enemy fighters, you can drop to the deck and attack the Weisbaden airfield once the bombers have dropped their bombs. Expect to meet up with some fighter resistance at the Weisbaden airfield.

The next day, the Americans were to lose their current leading ace as Major George Preddy was shot down by friendly flak over Liege after scoring his 26th and 27th kills. Also on the same day, back in the States, the ultimate American secret weapon was a step closer to completion. The first irradiated slugs of uranium were prepared, and within a month, the first plutonium had been created. The atom bomb was just so much closer to readiness.

Hitler had one more secret weapon of his own. Not as devastating as "the bomb," it still could have caused considerable problems. It was the new Schnörchel tube, a device which would allow German submarines to stay underwater, away from the bombers and sub destroyers that had decimated them in the past. With new rapid-firing torpedo tubes and prefabricated factories, the subs could have had a considerable effect at sea. However, using the Enigma to intercept the German's transmissions, the Allies were able to send bombers out to where the subs were undergoing tests and destroy the first models. The delays thus caused prevented these new subs from entering the war in time to become a real menace.

For the rest of December, the Americans continued bombing missions and fighter strafing as weather allowed, but Luftwaffe resistance was light. As the 1944 came to a close, only Germany and Japan were left to wage war—Hungary having formally declared war on Germany at the very end of the year—but both Axis countries seemed determined to fight to the last square mile. Neither looked likely to surrender. However, Germany had lost all of the territory it had taken during the war, and its economic condition, particularly in the area of oil and fuel, was critical and nearly hopeless. But Germany wasn't through just yet. Although they did not know it at the time, the Germans were preparing another of their surprises—Operation Bodenplatte.

As 1944 ended and 1945 began, Hitler's forces were faced with impossible odds, though the Führer hadn't yet accepted defeat. Germany was surrounded and its enemies closing in. On the Eastern Front, approximately 3 million German soldiers faced around 6 million Russians. The Germans had perhaps another 2.5 million reserves. The Russians had another 5.5 million. With perhaps 4,000 tanks against 12,900 and fewer than 2,000 planes against more than 15,000, the German situation in the East was less than hopeful.

On the Western Front, the Ardennes offensive was breaking down. Superior Allied air power and better supply lines meant the American forces gradually took the upper hand. Fuel shortages caused the German advances to bog down, and the lack of reinforcements meant that they could not sustain their push. Inexorably the Americans attacked the "bulge" and beat back the Germans.

"You can't smash terror by philosophizing, you have to smash it by using even greater terror."
—Adolph Hitler, January 27, 1944.

Chapter 20
1945

OPERATION BODENPLATTE

The Luftwaffe must have noticed the success of the American strafing missions, because, on January 1, 1945, they launched a massive 1,000-fighter attack on Allied airfields in France, Belgium, and Holland. This raid, Operation Bodenplatte, was somewhat successful—destroying more than 150 Allied planes, mostly on the ground— but the Luftwaffe lost at least 91 planes in the process. (Other sources cite their losses at an even more incredible 277 planes.)

In one incident, Lt. Col. (and eventually four-star General) John Myer—the current leading ace after the death of Preddy—was leading 12 aircraft of the 487th when about 50 German fighters appeared overhead. As nearby P-47s engaged the attackers, the P-51s were able to get airborne. Once in the air, and for the next 45 minutes, they shot sown 13 FW 190s and 10 Me 109s. Two pilots downed five each, and Myer got two more to lead the VIII Air Force with 24.

JANUARY 1, 1945 MISSIONS

Operation Bodenplatte

P51D MISSION 6

Patrol the English Coast

It is early morning on New Year's Day, 1945. You and your wingman are on a routine patrol over the English coast. Suddenly, you receive a radio message informing you that Allied radar has detected several high speed enemy aircraft incoming from the East.

Searching the sky for bandits, you spot them about 8,000 feet above you. But, you've never seen anything like this before... just flying WINGS with no nose or tail. And, they're moving faster than anything you've ever flown against.

Your Mission

You and your wingman are to intercept the incoming bandits before they reach Thorpe Abbots airfield. There are many B-17s parked there, prime targets for a surprise attack by the Secret Weapons of the Luftwaffe.

Strategy

Climb hard to meet the incoming Gothas above you and follow them down as they dive. Remember speed is on the enemy's side. Make every shot count. Another group of Gothas will approach below you. Keep an eye out for them. Once they get by, you'll be hard pressed to catch them.

ME 109G MISSION 3

Operation Bodenplatte

On January 1, 1945 the Luftwaffe launched a surprise offensive against Allied airfields in Holland, Belgium, and northern France. Designed to destroy the Allied Tactical Air Forces in these areas, Operation Bodenplatte involved nearly 800 Luftwaffe fighter planes. The attack was very successful against some airfields, with 150 Allied planes destroyed and another 50 heavily damaged.

However, the operation cost the Luftwaffe dearly: nearly 300 German aircraft were lost, 151 pilots killed or MIA, and 63 pilots captured. Of the pilots who died, 26 were high ranking, experienced commanders or leaders. Also, many of the aircraft lost were hit by German flak, as their flak installations had not been notified of the operation.

Your Mission

As participants in Operation Bodenplatte, you and your wingman, flying Bf 109s are to attack the aircraft and buildings of Deelen airfield. Your Bf 109 is armed with bombs. A pair of FW 190s is on the attack run with you. As you approach the airfield, you will notice P-47s patrolling the area. There is also a flight of P-51s preparing to take off from the strip.

Strategy

You are leading the Bf 109s in this mission. Follow the FW 190s to the target airfield. As you approach the airfield, several P-47s will show up. Dogfight the P-47s before you begin your bomb run. Go for the hangars if you can. Don't hang around the airfield. After you drop your bombs, several P-51s take off from the airfield. The P-51s can outrun you, so you'll have to dogfight them before you return home.

GOTHA MISSION 1

Surprise Attack on Thorpe

On January 1, 1945, the Luftwaffe launched a surprise offensive against Allied airfields in Holland, Belgium, and northern France. Designed to destroy the Allied Tactical Air Forces in these areas, Operation Bodenplatte involved nearly 800 Luftwaffe fighter planes. The attack was very successful against some airfields, with 150 Allied planes destroyed and another 50 heavily damaged.

As a hypothetical extension to Operation Bodenplatte, a lone Gotha could have been dispatched to bomb and strafe the airfield at Thorpe Abbots, England.

Your Mission

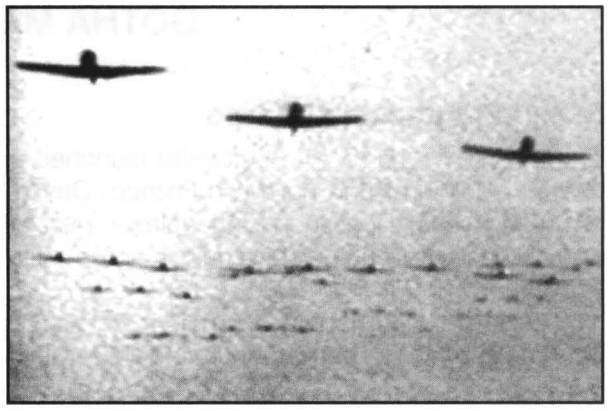
As a very special participant in Operation Bodenplatte, you are flying a lone GO 229 on a secret mission to bomb and strafe Thorpe Abbots. Coming in fast and low, you are to bomb the hangars there and strafe as many aircraft as possible. It is imperative that you complete your mission safely. UNDER NO CIRCUMSTANCES ARE YOU TO ALLOW YOUR AIRCRAFT TO FALL INTO ENEMY HANDS.

Strategy

As you approach the coast, don't engage the first group of P-47s you encounter. Instead, apply 100% power and get by them. Once you're over the target, begin your bomb and strafing run and get out fast. Don't dogfight near the target airfield. If the enemy fighters follow you home, use the anti-aircraft guns of your home field to your advantage. If your plane is severely damaged, you can land at any Luftwaffe airfield, but you'll receive a bonus if you can make it to your home field.

For most of the month of January, the majority of bomber missions were tactical in nature, directed against transportation targets in general. Only a few missions were redirected against the ailing German oil industry. Part of this was due to the inclement winter weather which was cold, snowy, and cloudy for the most part.

The first large mission of the month occurred on January 14th when more than 600 bombers returned to oil plants in northwest Germany. Most of the Luftwaffe resistance was met effectively by the Mustang escorts. In fact, the Mustangs scored impressively against the Luftwaffe. In one engagement, the squadrons of the 357th Group sighted a large group of E/A assembling for the "company front" attack, a mass attack on the bombers. Each squadron attacked the German units, and, though outnumbered 2 to 1, the Mustangs claimed 56 German fighters for only 3 of their own. This was the highest score to be obtained by a single group throughout the war. In other engagements, the results were similar, and even the Thunderbolts of the 56th scored 19 against 3 losses. Of the more than 300 Luftwaffe fighters involved, almost 90 of them were claimed as shot down.



Meanwhile, the battle of the Ardennes was winding down. With a new concentrated attack by the Red Army to retake Poland, Hitler had to transfer several divisions to counter them. The Germans had, after initial successes in the Ardennes campaign, lost their opportunity and finally, on January 8th, the German commanders were allowed by Hitler to withdraw. They were back to their previous positions by January 16th having as many as 120,000 dead, wounded, and missing. On the American side, casualties were also high. At least 8,000 were dead, but 48,000 more were wounded and 21,000 captured or missing. The Germans had lost as many as 1,600 planes and 6,000 ground vehicles. In the end, this was a major turning point in the war. It was believed that Hitler could not mount such an offensive again. He had already lost all the gains he had made since 1939 and, with the Russians on one side and the Americans on the other, he was in a virtually hopeless position. In fact, Hitler reportedly laughed when one of his SS colonels quipped, "Berlin will be most practical as our headquarters: we'll soon be able to take the streetcar from the Eastern to the Western Front!"

"we'll soon be able to take the streetcar from the Eastern to the Western Front!"

Of course Hitler was unable to appreciate his position, having completely lapsed into a world of his own devising. When his own generals were not joking and tried to let him know the facts, he accused them of being crazy and suggested heatedly that they be locked up in asylums.

After forcing the Jewish labor crews to dismantle the crematoria at a concentration camp in Mlawa in Poland, the Germans decided to kill the workers to hide the evidence of their crimes. However, in typically sadistic fashion, they made a game out of it. Mordechai Zurawski recounted the event. "We were placed in a row; each man had a bottle on his head and they amused themselves shooting at the bottles. When the bottle was hit, the man survived, but if the bullet landed below the mark, he had had it." That night, the SS came and took the survivors out, five men at a time and shot them. Zurawski hid, stabbed the guard with a knife he had managed to hide, and escaped. One other prisoner escaped as well, having been shot but not killed. Both men later testified at the Nuremburg trials, and later at the trial of Adolf Eichmann in Jerusalem in 1962.

By late January, the Russians took Silesia, an area of critical importance to the German war industry as it supplied more than 60% of their coal (which was necessary for producing steel and synthetic oil). This loss caused Albert Speer to begin a memorandum to the Führer, "The war is lost." Hitler refused to read the rest of the memorandum and refused to see Speer.

The Russian occupation of Silesia came too late for thousands of Jews who were marched, on foot, from Auschwitz and other death camps, later to be put on trains, wagons, and lorries and taken to other camps. Many never made it, and were shot along the road by the SS guards. Others, too weak or sick to attempt the march were simply shot or abandoned to die. One of those abandoned at Auschwitz was Prima Levi, later a Nobel Laureate. He wrote, "We lay in a world of death and phantoms. The last trace of civilization had vanished around and inside us. The work of bestial degradation, begun by the victorious Germans, had been carried to its conclusion by the Germans in defeat."

The famous "death marches" sometimes included as many as 2,500 people in a single column. Few escaped. Most were weak and sickly from the brutal treatment of the camps. Accounts of these marches are horrible beyond imagination. Stan Wells, a British POW wrote, "I was struck dumb with a miserable rage, a blind coldness which nearly resulted in my being shot. Never in my life have I been so devoid of fear of opening my mouth. They came straggling through the bitter cold, about 300 of them, limping, dragging footsteps, slipping and falling, to rise and stagger under the blows of the guards—SS swine. Crying loudly for bread, screaming for food, 300 matted haired, filthy objects that had once been—Jewesses! A rush into a nearby house for bread resulted in one being clubbed down with a rifle butt, but even as she fell, in a desperate movement she shoved the bread she'd gotten into her blouse."

As hopeless as the situation was for the victims, their captors had little to look forward to. It seems that the only hope the German leaders had left was that the Allies would join with them against the Russians who were rapidly conquering Germany while the Americans were being held off more successfully. This was a slim and unrealistic hope, but the Nazis had never been short of such desperate illusions.

OPERATION CLARION

On February 3rd, good weather allowed a large raid back to Berlin. The raids on this day concentrated largely on oil targets near Berlin including infamous the oil facilities at Magdeburg.

Among those participating in these raids were several old timers. The *Birmingham Jewel* was finally shot down after 128 missions. Even more incredible is the story of Maj. Robert Rosenthal who flew with the often blasted, so-called "jinxed" group, the 100th. Rosenthal had been the pilot of the only bomber to return from the mission to Munster that had claimed the rest of his group, and had barely managed to nurse his crippled bomber to safety on two other occasions. This time he was flying his 52nd mission when his bomber was hit and disabled. Ordering the crew to bail out, he did the same a little later. Presumed lost, it was with great relieve that the 100th received word that Rosenthal had made his way safely to Moscow.

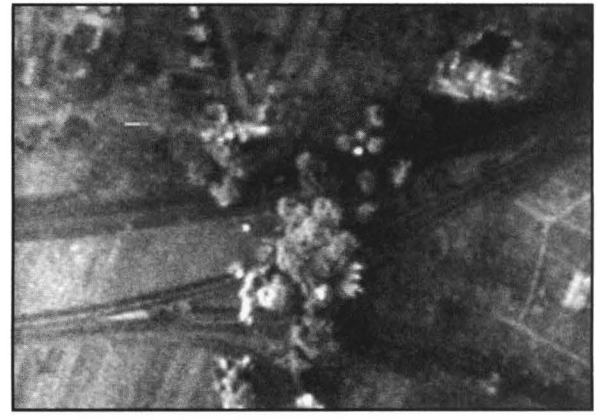
Also on the 3rd, elements of the 55th, while on a strafing run, spotted strange aircraft that turned out to be coupled Ju 88s and Me 109s. The Germans were experimenting with remotely controlled bombers filled with explosives just as the Americans had experimented with Aphrodite. However, nothing came of it except that the 55th shot down several of the planes they had spotted, which were on a training mission.

On February 6th, another of those strange incidents that characterized the war occurred. On this day the bombers had set out, but the weather was not cooperative and they were all recalled. All except one, that is. This lone bomber continued on unaware, delivered its three tons of bombs on Essen and returned—without mishap!

During the last two weeks of February the weather improved. Allied high command had meanwhile decided that the next target for the strategic bombing effort would be the German communications network. This effort became known as Operation Clarion.

The decision to focus on communication targets was arrived at during a conference at Yalta on February 4. At the Yalta Conference, Churchill, Roosevelt, and Stalin met to discuss post-war boundaries and other potential problems that would face post-war Europe, including the disposition of Germany, what reparations should be required, and what should be done with Russian troops who had fought with the Germans. Churchill and Roosevelt extracted, with some coercion, a promise from Stalin that free elections would be held in Poland, but Stalin had his own plans for Poland and his promises were meaningless.

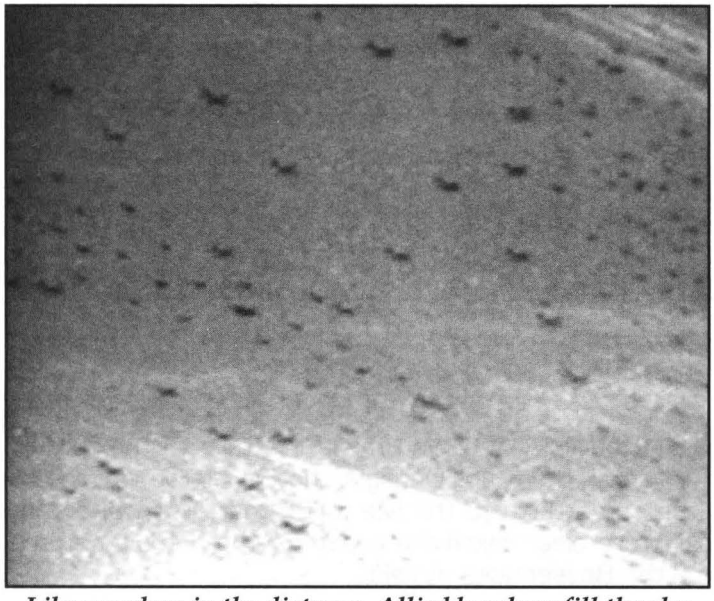
During the conference at Yalta, the Soviet General Antonov called for help from the American and British bombers to prevent the Germans from moving additional troops against his Red Army. He asked that the German communication network in the Berlin, Dresden, Leipzig area be disrupted. The decision to support his request was to lead to one of the great tragedies of the war—the fire bombing of Dresden. On the night of February 13 and the morning of the 14th, first British and then American bombers attacked the rail yards at Dresden, igniting a firestorm that burned for a week. On the 15th, more American bombers added to the carnage. Nobody knows how many died—possibly 50,000 or more, though recent evidence suggests that the death toll was less than that at Hamburg. Nobody will ever know for sure. Even a sign in the cemetery at Dresden asks, "How many died? Who knows the number?"



Prisoners from the nearby POW camps were sent to dig out the corpses. One of the POWs, Kurt Vonnegut Jr. wrote, "Every day we walked into the city and dug into

basements and shelters to get corpses out, as a sanitary measure. When we went into them, a typical shelter, an ordinary basement usually, looked like a streetcar full of people who'd simultaneously had heart failure. Just people sitting there in their chairs, all dead."

On February 19, Himmler met secretly with Count Folke Bernadotte of the Swedish Red Cross to see about opening negotiations with the Western Allies. Bernadotte told Himmler that a first step would be to transfer the concentration camps to the International Committee of the Red Cross, but Himmler was only willing to let the Red Cross send food, and then only to the Nordic prisoners, not the Slavic or Jewish ones.



Like smudges in the distance, Allied bombers fill the sky.

On February 22nd, 1,411 heavy bombers went out with heavy fighter support and headed for diverse targets in Operation Clarion. Because many of the targets for the day were small, and to avoid unnecessary bombing of civilians, the bombers were to drop their loads at only 10,000 feet, half the height they normally flew. This made the mission more dangerous, but it was offset by the fact that most of the targets were not in heavily defended areas, so ground fire was not expected to be a major factor. On the other hand, Luftwaffe attacks were expected.

As it turned out, only one straggling B-17 was shot down that day by an Me 262, and only four others were lost to flak. The next day, 1,193 heavies were again filling the German skies. Again the opposition was minimal and only two failed to return, though many had some kind of flak damage to show for the mission.

Fighter strafing missions went out also, destroying and disrupting traffic on rails and roads. In one encounter, pilots from the 479th engaged several groups of Me 262s, and, although the outcome was inconclusive, the quality of both the jet and its pilots gave the Americans all they could handle. Up to this point, the Me 262s had shown a reluctance to engage the fighters, keeping to their anti-bomber missions. However, on this day, it was obvious they were ready for a fight.

Thousand-bomber missions followed for the next eight days and opposition was light. In fact, the AA batteries were running low on ammunition and the whole German economy was suffering at this point. Moreover, the radar jamming techniques were becoming more effective, further nullifying the effects of the radar-controlled guns.

FEBRUARY, 1945 MISSIONS

P-51D MISSION 4

Operation Clarion

In late February, 1945 the Eighth Air Force initiated a new offensive: Operation Clarion. Carried out by 6,000 Allied aircraft, Clarion was designed to cause maximum disruption to German road, rail, and canal traffic in a brief period of time.

Your Mission

Flying low in a formation of 6 P-51Ds you are to follow your flight leader to attack the Koblenz railway center. Each of your fighter-bombers is equipped with bazooka rockets and a single 1000 lb. bomb. Once you've hit the railway center, fly NE to strafe any aircraft on the ground at Bassenheim Luftwaffe airfield.

You'll probably encounter stiff resistance from the Luftwaffe, as this is known to be a very active area.

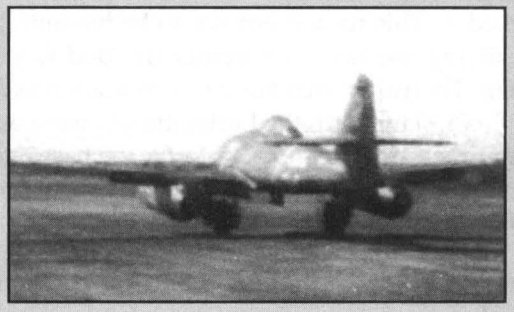
Strategy

Stay in formation and keep low to avoid the flak. After you make the turn to the target, take the lead and hit the FW 190s to break them up. Dogfight the FW 190s to protect the other planes in your group. Do the same thing to the Me 262s that arrive after the FW 190s are driven off. After the skies are clear rejoin the group for the bombing attack against the Koblenz railway center and the Bassenheim airfield.

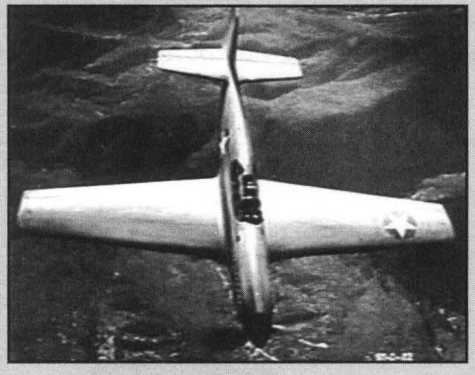
February 22, 1945 encounter with Me 262

From the combat report by 435th Fighter Squadron of an encounter with 16 Me 262s. "The bounce was directed at Red Flight as squadron was making shallow turn to left from an easterly direction. Bounce came from 3 o'clock position at our level by four Me 262s looking like P-51s with belly tanks. Our Red flight broke into jets but they crossed in front of our flight up and away. A second flight of four Me 262s then made a bounce from the rear, 6 o'clock high. Our flight turned into this second Me 262 flight and the Me 262s broke climbing up and away. At this time the first flight of Me 262s came back on us again from above and

to the rear. We broke into this flight and this kept up for three or four breaks, neither ourselves or Jerry being able to get set or close in for a shot. Each time we would break they would climb straight ahead outdistancing us. Within the Jerry flight the No. 4 man, while turning would fall behind and slightly above, so that it was necessary to take on this No. 4 man or he would slice in on our tail if our flight would take on the rest of the Jerry flight.



"White Flight encountered four Me 262s in the same area. They came in on pass from above. High and to the side, two ships on each side. Our White flight would turn into jets and they would climb up and away. To follow would have left our flight open to a bounce from the remaining two jets.



"The Jerry pilots were aggressive and experienced. They were not caught in a turn, and if caught in such a position would roll out and climb up and away. It was impossible to catch or climb with them. Broke off engagement at 12.10 hours. Fighting took place from 12,000 up to 26,000 ft. A P-51 cannot climb with the jet particularly if the jet has an initial altitude advantage. However, P-51 can out-turn a jet. Ref flight out-turned jets just after being bounced without dropping tanks. The jet is faster on straight and level run. Their rate of roll is excellent, but turning radius is poor. . ."

On February 25th, the P-51s met the Me 262s again, but this time they had the advantage. Catching one group of jets just taking off, they were able to bounce them, shooting down six. Later, another two were shot down that day in similar situations.

The competition between some of the groups was getting all the more fierce. Both the 4th and the 56th were closing in on 1,000 kills, and each wanted to be first. The other American pilots were caught up in the spirit of the "hunt" for Luftwaffe planes. Their consistent out-scoring of 6 or 7 to 1 gave them confidence that they were unbeatable, and it appeared close to true.

March 2nd was an active day which saw several events of interest. With headwinds making their approach on the synthetic oil factory near Leipzig difficult, the bombers of the 305th Group, flying their 300th mission, were sent in to bomb the feared gun batteries at Merseburg. Scoring cleanly with the loss of only three Forts, they were to obtain a measure of revenge against these feared enemies.

On the same day, a bomber crew was transferred from one ailing bomber to a new one and took off a little late. Thinking they could regain the formation before reaching enemy territory,

the pilot, 2/Lt. Charles "Hotrock" Carpenter steered the Fortress toward a large formation and joined it. This turned out not to be his unit, but a force of RAF Lancasters headed for Cologne. Realizing the error, Carpenter decided to join the Lancasters and bombed and returned with them. Thereafter, that bomber was known as *RAFAAF*.

On March 3rd, the Luftwaffe jets were once again active, scoring in hit and run attacks. That night the Me 410s returned to the air bases in England for another of their surprise attacks—the first in nine months. Although they returned the next night, they were not able to inflict any serious damage in either raid.

On the 4th, weather once again obscured the ground, and bombing was less accurate. In fact, one incident that became a bit of a problem developed when American heavies mistakenly bombed two cities in Switzerland, forcing General Spaatz to appear personally to make apologies.

By the end of February, a large number of the attacks on the daylight bombers had been carried out by Me 262s flying at high altitude. However, in March an elite group became operational in the 262s. This was the famous Jagdverband 44 under the leadership of Adolf Galland. This was quite possibly the most talented and experienced group of fighter pilots ever assembled and featured many of the still living Luftwaffe aces. Several of these pilots had more than 300 kills.

Despite the formidable nature of Galland's new group, and the superiority of their plane, they were only one group and would not be able to turn the tide of the war where the Allies were sending thousands of bombers and fighters over the German skies. Jagdverband 44 was just another desperate too-little-too-late move by the Germans. By this time, only the Rhine and the Oder rivers were effectively blocking the advance of the eastern and western forces on Berlin.

On March 6, the British authorities learned that the Russians were purging Poles loyal to the London-based government in exile and deporting still more Poles to the Soviet Union to work camps. They were mistreated with the same brutality that others had experienced at the hands of the Germans. On the other hand, refugee Polish Jews returning home were sometimes killed or driven away by the locals who didn't want them back.

On March 7, the Americans found the Ludendorff Bridge still spanning the Rhine at Remagen (most had been destroyed by the Germans). However, as they began to cross it, German engineers attempted to set off charges to blow it up. Fortunately, the engineers had placed the charges evenly under each support, so when they blew, the bridge did not twist and collapse, but settled back onto its supports. The bridge remained intact, and the Americans were able to cross it. Since Napoleon in 1805, no invader had ever crossed the Rhine. Now the Allies had done it. That night, Hitler dismissed Field Marshal von Rundstedt as Commander-in-Chief, once again blaming his commanders for their failure to prevent the inevitable.

On March 15 there weren't many encounters, although Ray Wetmore, the current active top scorer with 21 victories, got number 22 when he spotted and successfully engaged an Me 163. On the same day, when German Blitz-Bombers attempted to destroy the American-held bridge over the Rhine at Remagen, 16 of 21 jets were shot down. Previously 11 V-2 rockets had been fired at the bridge, one landing only 300 yards away. Also on the 15th, American bombers destroyed the most important site of the Germans' atom bomb project, a thorium ore processing plant at Oranienburg.

The bridge at Remagen was of considerable importance to the Germans, and on the night of the 17th, six frogmen were sent to detonate explosives and destroy the bridge. Unknown to them, the bridge had already collapsed from a combination of stresses, killing 25 engineers. The German frogmen were all captured, and temporary bridges had by now been erected across the Rhine.

On March 18th, the Allies returned to Berlin to provide support for the Russian advance. With 1,327 heavies, they swarmed over the Berlin skies. The main resistance the Luftwaffe was able to put up came in the form of concerted attacks by Me 262s which claimed some of the bombers, but was unable to deter the attacks or even cause significant damage. However futile their efforts, the Luftwaffe jets did their best to damage the bomber formations, going up day after day during March. On occasion, as on March 21st, they had some successes, but all the efforts of the Germans at this point were simply postponing the inevitable.

MARCH 18, 1945 MISSIONS

Intercept a Bombing Raid on Berlin

ME 262 MISSION 6

By February, 1945, fuel shortages, attrition of experienced pilots, and the impact of Allied air attacks were serious threats to the Luftwaffe's ability to function cohesively. And yet, toward the end of February, the entrance of the Me 262 Jagdgeschwader (JG 7) into the war brought a significant increase of jet activity. In March, most of the high-altitude bomber interceptions were by Me 262s. From mid-March on, these attacks were made at gruppe or staffel strength, and their high degree of precision indicated that the Luftwaffe still had a few "aces up its sleeves."

On March 18 the Eighth Air Force launched it's heaviest attack in the war on Berlin, sending over 1300 bombers to aid the Russian army's advance from the east. JG 7 responded by sending up 37 Me 262s, losing two of these to defensive bomber fire. At least five heavies were claimed by the 262s, while Berlin's flak claimed another 29 bombers destroyed, with 16 more so damaged they had to make emergency landings behind Russian lines.

Your Mission

As part of JG 7's elite unit of Me 262 fighters, you are to intercept the stream of B-17s approaching various targets in Berlin. Follow your flight leader in for your initial pass, and make the most of your jet's R4M rockets. Another flight of Me 262s is approaching the bombers for a stern attack, so be careful not to hit them while shooting at the bombers.

Strategy

In this mission, a large formation of B17s is being escorted by a pair of P-51s. There are two groups of Me 262s approaching the bombers from opposite directions. You're in the first group making a head-on approach. As you begin your attack against the bombers, the opposite group is also making its attack. Be careful not to hit friendly aircraft as you move in close. If the escorts become a problem, you have time to take care of them in this mission.

ME 163 KOMET MISSION 4

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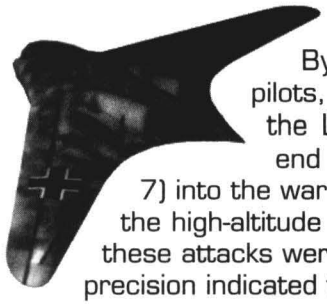
Your Mission

As part of a combined effort between J.G.7's Me 262 interceptors and the Me 163s of 1./JG 400, you are to intercept the stream of B-17s approaching various targets in Berlin. Stay in tight formation as your flight leader takes your schwarm of Komets up from Doberitz airfield, climbing to 30,000 feet. Then level out and glide to your vectored interception point hitting the bombers with a head-on attack. Use your SG 500 vertically firing rockets to disable a bomber on your first pass. The Me 262s from J.G.7 are approaching the B-17s from the northeast, so be aware of their presence as you make subsequent passes at the bombers.

Strategy

The hardest part of this mission is to stay in formation as you attack the bombers, and it is imperative that you do so. Your flight leader will lead you to the bombers, so follow his lead. If you run out of fuel in this mission it is possible to glide home if you have sufficient altitude. Use your speed to make fast attack runs and watch out for your wingmen as you attack.

GOTHA MISSION 5



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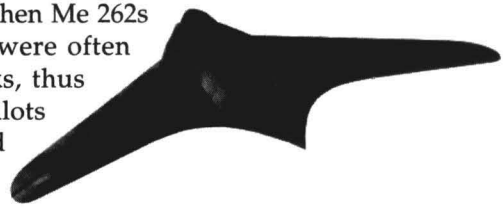
Your Mission

As part of a hypothetical combined effort between JG 7's Go 229 intercepters and the Me 163s of 1./JG 400, you are to intercept the stream of B-17s approaching various targets in Berlin. Piloting a Gotha flying wing, lead your two wingmen southwest to attack the bombers head-on. Use your R4M rockets to knock the bombers down more quickly. The Me 163s from 1./JG 400 are approaching from the east, so be aware of their presence as you make subsequent passes at the bombers.

Strategy

Fly at cruise speed until you see the bombers, then increase your speed to 100%. You have some time before the bombers reach the target so go for the fighter escorts first. By eliminating the escorts, you'll give the other attacking aircraft a clear shot at the bombers. Once the fighter escorts have been eliminated, begin your attack run against the bombers.



Meanwhile, on the 19th, the 78th Group was on escort when Me 262s swooped in to attack them. These attacks by the jets were often designed to make the P-51 pilots drop their belly tanks, thus limiting their range. However, most of the Mustang pilots refused to do that, and in this case the jets soon sped away while the 78th continued on. Soon they encountered several formations of Me 109s forming for an attack on the bombers, but the 78th attacked with 48 Mustangs against a roughly equal number of 109s. The result of the encounter did much to bolster the morale of the 78th, who had lost a lot of planes and pilots on strafing runs since converting to the Mustangs. In this encounter,

they got 32 confirmed kills against only 5 losses. Two of their victories were against the new Arado 234 jets which were being spotted more and more.

The 78th was the most successful group against the German jets. On the 21st, they were able to claim six Me 262s and on the next day, three more. In all, they got 13 of the 43 claimed for March.

Also on March 22nd, the 4th, still tightly in the race against the 56th Group, claimed 11 FW 190 fighter/bombers, catching them as they took off to bomb the Russians.

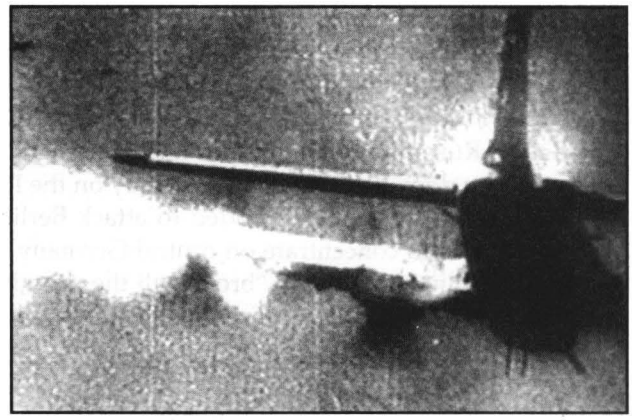
In other action on March 21, a combined British and American mission carried out a precision attack on a former Shell Oil building in Copenhagen where the Gestapo was keeping records about the Danish Resistance. On the top floor were 32 prisoners and in the basement were more prisoners. The raid had to fly at low altitude and hit only three floors in the middle of the building. They were successful, killing almost a hundred Germans and their collaborators, but nine of the planes were lost, and one, which tangled with a power line, fell on a school. The resultant blaze of the burning school building caused another plane to drop bombs, thinking it a target. In all, 11 nuns and 86 children were killed. Also on the 21st, attacks were aimed at many of the landing fields used by the German jets and several were made unusable.

On the same day, General Guderian, one of the principal architects of the famed *blitzkrieg* that had won so much for Hitler, counseled an end to the war, but Hitler would still not give up. Incredibly, he still believed that he could win the war. As usual, Guderian was dismissed.

On March 24th, the bombers and the fighters were up in force, sometimes flying two or three missions in support of the airborne assault on the Rhine. In one encounter, Mustangs from the 353rd fought with two *gruppen* of Luftwaffe fighters and were able to destroy 29 of them with 5 of their own lost. Two of the group's pilots scored five each in the encounter.

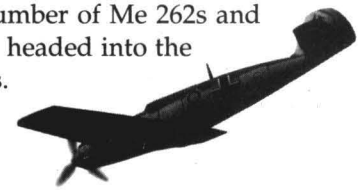
On March 25th, American forces captured areas where the main German jet fields were located, near Frankfurt and Darmstadt, effectively reducing the jet threat.

In March 1945, the Mighty Eighth sent up bombers on 26 days, each mission averaging more than a thousand heavies. They dropped more than 30,000 tons of bombs on the Germans, and they were joined, as usual, by the RAF and the U.S. Fifteenth Air Force. In all, this was another record month. By the end of March, the official scores for the top fighter groups read 867 for the 4th and 865 1/2 for the 56th. Meanwhile, there were close to a hundred bombers that had now flown 100 missions or more, and the pioneer bomber groups were closing in on 350 missions.



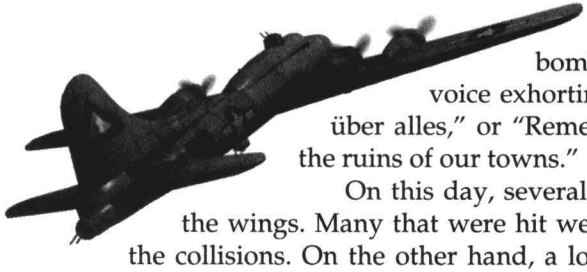
In early April, the shrinking German territory and the lack of fuel prevented much activity on the part of the Luftwaffe, although the Me 262s were in evidence on the 4th, shooting down several bombers, and again on the 5th where they got one Fortress.

On April 5th another record was set, and this a truly remarkable one. Master Sergeant Hewitt Dunn returned safely from his 100th bomber mission. For more than two years, Dunn had been a gunner on B-17s and had flown over almost all the dangerous targets in Europe. He was the only American to fly in more than 100 missions entirely in Europe, where the chances for survival were so low—especially in 1943 when Dunn started his first tour. He finished his career with 104 missions, a figure that was unmatched by any other American bomber crewman.



The Luftwaffe made another stand in force on April 7th. A number of Me 262s and perhaps 100 Me 109s and FW 190s awaited the bomber stream as it headed into the remains of Germany to bomb ammunition and oil industry targets. Forming at the once-routine interception points of Dummer Lake and Steinhuder Lake, the Luftwaffe pressed a determined attack—and unveiled a new and deadly tactic.

Back in March, Göring had called for volunteers for a new and dangerous operation. About 300 recruits were then given some flight training and a lot of political indoctrination to bring them to a fever pitch of patriotism. They were then instructed to attack the bombers, firing from extreme range, and to attempt to ram the bombers. Only when they were sure they would successfully hit the bomber would they attempt to parachute to safety. This was the rumored Ramstaffel, essentially a suicide squad like the Japanese kamikazes—originally proposed by Hanna Reitsch. The eventual staffel that was created was called *Sonderkommando Elbe*. With more planes than pilots and fuel, this must have seemed like a good way to destroy more bombers and at the same time strike fear in the hearts of the Americans.



The suicide pilots were vectored to the bombers by VHF signals which also carried a woman's voice exhorting them with patriotic statements like "Deutchland über alles," or "Remember our dead wives and children buried beneath the ruins of our towns."

On this day, several bombers were rammed head-on and sometimes in the wings. Many that were hit were destroyed although several were able to survive the collisions. On the other hand, a lot the American fighters and bomber gunners were able to shoot down 59 single engined fighters that day, probably the majority of them from the *Sonderkommandos* who were not trained in evasive tactics, nor was their mission to evade.

This was to be the only mission of the Ramstaffel, and only eight instances of ramming were known to have occurred. In all, 18 bombers were lost in the encounter.

Meanwhile, Hitler had moved into bunkers deep underground, but would hear nothing of surrender. Even Himmler still believed that the Me 262s would give them some 'breathing room,' but as the Russians captured the last of Germany's available oil fields at Nagykanizsa in Hungary, the door closed even more firmly on the Reich's hopes.

Meanwhile, Stalin had decided to attack Berlin on the 16th and had persuaded the British and Americans to concentrate on central Germany and Yugoslavia. However, Churchill, having noted that Stalin had already "broken all the promises he made at Yalta," determined that it was important that the Western Allies "shake hands with the Russians as far East as possible."

APRIL 7, 1945 MISSION

ME 262 MISSION 3

Intercept B-17s Near Hanover

On April 7, 1945, a force of over 1000 heavy bombers took off from England bound for destinations in northwest Germany. Their targets included airfields, oil storage installations, and armament industries. Approximately twenty Me 262s and over 100 single engine fighters attacked the bombers above Dummer and Steinhuder lakes. About 20 jets and fifty other fighters got through the screen of Mustang escorts to hit the bombers. The German attack lasted about 45 minutes, during which time at least five B-17s were shot down or rammed by FW 190s and Bf 109s. At least three bombers were shot down by Me 262s.

On this day, bomber gunners made claims of 41 enemy aircraft destroyed, with 16 more probable or damaged.

Your Mission

Leading a schwarm of Me 262s, your orders are to stop the formation of bombers nearing a munitions factory in Hannover. Your flight of jets is armed with R4M 55-mm air-to-air rockets. A pair of Bf 109s is also close by, with orders to intercept the Allied escort fighters.

Strategy

As you approach the bomber formation, you'll find two groups of four bombers. Be practical in your attacks against the bombers and use your tremendous speed to your advantage. Remember not make turns when in firing range of the bombers. Work on the outside edges of the formation first, then attack the inner planes.

For the three days following the April 7th battles, the heavy bombers were sent to destroy those airfields suspected of being the home bases for the jet fighters. On April 10th, they met the largest force of jets yet encountered—an estimated 50 Me 262s. The jet formation was broken up by the fighter escort, but the Germans were able to get at the bombers in ones or twos and, attacking swiftly from the rear, they would fire and then escape. At least ten Forts went down from their attacks. The American fighters put up what resistance they could, but still had trouble keeping up with the faster jets. However, the jets would run out of fuel before the Mustangs would, so the Americans would fly around the jet airbases and bounce the Me 262s as they came in for a landing. In this way many of the 20 or so jet fighters shot down on April 10th were bagged.

In addition to the action around the bombers, several of the fighter groups destroyed enemy planes on the ground. In fact, the official claim was for 284 aircraft destroyed by strafing. The 56th Group climbed into the lead against the 4th by claiming 45 (including 2 jets shot in the air).

The next day, however, strafing was banned as the danger of hitting the advancing friendly troops became more likely.

APRIL 10, 1945 MISSIONS

B-17 MISSION 5

Bomb Oranienburg Airfield

On April 10, 1945, a force of 1300 heavy bombers targeted airfields thought to be jet bases. Approximately 50 Me 262s rose to intercept the bombers. Using tactics that involved an attack by one or two aircraft, mostly aimed at stragglers or outer elements of the formation, the jets had their most successful day against the Eighth Air Force heavies. But this was not without cost to the Luftwaffe: 20 Me 262s were claimed as destroyed on this day.

Your Mission

Flying in formation of eight B-17s, you are to bomb the airfield at Oranienburg. Watch for Me 262s intercepting. Escort fighters are on their way, but you'll probably have to hold your own for a short time.

Strategy

In this mission, you are the leader of eight B-17s. There are three pairs of Me 262s attacking your group. Shoot early to keep them at bay. P-51s join you later in the mission and will escort you to the target.

ME 262 MISSION 4

Defend Oranienburg Airfield

On April 10, 1945, a force of 1300 heavy bombers targeted airfields thought to be jet bases. Approximately 50 Me 262s rose to intercept the bombers. Using tactics that involved an attack by one or two aircraft, mostly aimed at stragglers or outer elements of the formation, the jets had their most successful day against the Eighth Air Force heavies. But this was not without cost to the Luftwaffe: 20 Me 262s were claimed as destroyed on this day.

Your Mission

You and your wingman are north of the bombers as they approach your home airfield at Oranienburg. They appear to be unescorted, so you should be able to concentrate fully on stopping the bombers. Other 262s are operating in your immediate vicinity, so be aware of their presence. Your jets are armed with R4M 55-mm air-to-air rockets.

Strategy

In this mission you'll find that the bombers are almost to the target and there is not a lot of time to shoot them down. You have to work fast and make every shot count in order to succeed. One P-51 shows up during your attack, and the pilot is really good. Try to avoid him if possible. It does no good to shoot him down since the P-51 is constantly refreshed during the mission.

BEGINNING OF THE END—END OF BEGINNINGS

By now, the Allies had just about taken over, and perfect weather greeted the last of the large scale strategic bombing efforts on April 11th. The missions for the day included airfields, oil storage, and munitions dumps.

At the Buchenwald concentration camp on April 11, the Gestapo telephoned to say that they were sending explosives to blow up the camp and its prisoners, but the camp authorities had already deserted. Those who answered the phone were the prisoners, who told the Gestapo, "Never mind, it isn't necessary. The camp has been blown up already." Within hours, British troops arrived at Buchenwald. One of the survivors, Elie Wiesel, later wrote, "You were our liberators, but we, the diseased, emaciated, barely human survivors were your teachers. We taught you to understand the Kingdom of the Night."

The next day, April 12, 1945, President Roosevelt died. Hitler and his cronies rejoiced, as did the Japanese, thinking perhaps that Truman would not pursue the war to its conclusion. That hope was short-lived.

In a speech Roosevelt had meant to deliver the next day, he wrote, "More than an end to war, we want an end to the beginnings of all wars—yes, an end to this brutal, inhuman and thoroughly impractical method of settling the differences between governments."

"...an end to the beginnings of all wars..."

In the meantime, though the war was virtually over, Jewish prisoners were still being murdered. Near Gardelegen, in an all-too-familiar horror, five or six thousand Jewish prisoners were trapped in a large barn. Some escaped when part of the barn wall collapsed from the pressure, but the rest were herded back and burned to death. Those who sought to escape the flames were shot.

At Belsen, there were 30,000 prisoners, including Jews, Gypsies, German political prisoners, citizens of Luxemburg, France, Holland, Yugoslavia, Belgium, Czechoslovakia, Greece, and many Poles and Russians. These people were in such terrible states of starvation and sickness that, even when food and medical attention were available, they continued to die by the hundreds each day. Among the 30,000 living were 35,000 corpses. Moreover, not all their liberators showed the greatest of compassion for their suffering.

On April 13, there were smaller-scale bombing raids, but, with the ban on strafing lifted again, the Americans returned to the airfields to wreck what was left of the Luftwaffe's air power. Along with claims of 266 aircraft destroyed, the 56th was able to attack a loaded and under-defended airfield at Eggebeck and destroy 95 on their own—making them the first group to top 1,000 total victories. One of their pilots claimed ten planes at Eggebeck. Meanwhile, the 4th, having battled the 56th to the wire, could only experience the frustration of downing two seaplanes for the day's work.

APRIL 13, 1945 MISSIONS

P-47 MISSION 3

Attack Eggebeck

On April 11, 1945, the Eighth Air Force high command issued a field order that banned all strafing, partly due to the presence of Allied troops in close proximity to many German airfields, American fighter pilots were not allowed to strafe ground targets for fear of hitting friendly troops. Nevertheless, for some fighter groups, parked enemy aircraft proved to be irresistible targets.

On April 13th, the 56th FG took full advantage of such an opportunity at Eggebeck airfield, near Kiel in Northern Germany. When they were through, the Thunderbolt pilots of the 56th had destroyed 95 enemy aircraft.

Your Mission

Follow your flight leader in to attack Eggebeck Luftwaffe airfield. Use your rockets to destroy the buildings there, and strafe as many enemy aircraft on the ground as possible. Watch out for German air defenses.

Strategy

As you get close to the target you'll find a couple of Bf 109s on patrol over the airfield, while three Bf 109s are landing. The patrol aircraft pose a threat while the landing aircraft are harmless. Attack the Bf 109s on patrol before you make your attack run. As you begin your attack on the airfield watch the skies for two Me 262s that arrive as the attack begins. The key is to attack the airfield fast and get out quickly. There's a lot of anti-aircraft fire at the field so be careful not to dogfight within range of the target airfield.

BF 109G MISSION 5

Defend Eggbeck Airfield

This is the same operation as P-47 Mission 3

Your Mission

As you and your flight leader patrol the area around Eggbeck airfield, you receive a message from ground control alerting you to enemy fighters flying toward the field. Stay with your leader to intercept the incoming fighter-bombers and defend the airfield and the aircraft parked there.

Strategy

Remember that the P-47s will evade rather than engage you. There are three groups of them making their way to the target. Attack the closest one first. Refer to the map often to see the positions of the enemy aircraft. Destroy one group first, then move on to the next. Sporadic engagement of the groups is not advisable, as this will diminish your effectiveness.

The strafing claims for April 10th and April 13th, as high as they were, could not compare with the incredible numbers of planes destroyed on April 16th when the Allied pilots attacked airfields in southeastern Germany and Czechoslovakia. The day's total: 752 planes destroyed and many more damaged.

On that same day, the Red Army launched its attack on Berlin, firing half a million rockets, mortar,s and artillery shells. Three thousand tanks rumbled forward while the American fighters were masters of the air, shooting down those German jets still capable of rising into the air. Hitler's order for the day was, "He who gives the order to retreat is to be shot on the spot."

The Americans continued their liberation of the concentration camps. During the month of April, despite the mass killings and cover-ups by the Germans, more than 250,000 prisoners were set free.

"...the cow was dead."

On the 17th, even as the Americans were taking Nuremberg and the Russians were overrunning the Oder River and driving toward Berlin, Hitler stated another of his delusional predictions: "The Russians are in for the bloodiest defeat imaginable before they reach Berlin."

Also on the 17th, another 200 planes were destroyed on the ground, but on both these days, there were casualties and several Mustangs lost. Some of the pilots were able to escape, however. But in one incident, the most successful strafer and "loco-buster," Elwyn Righetti went down. Though he walked away from the plane, he was never heard from again, and it is thought that he was lynched by irate civilians. Unfortunately, the lot of airmen who crashed in enemy territory was very dangerous. Although some were made POWs and were fairly treated, others were shot, lynched, and even tortured.

The official end of the strategic bombing effort came on the evening of April 16th. Henceforth, bombing missions would be tactical in nature. Understanding the difference is often a matter of interpretation, but one book puts it well when it explains, "In layman's terms tactical bombing was likened to kicking over the bucket of milk every day, strategic bombing was trying to kill the cow: the cow was now dead."

Of course the bombers still operated, though not as actively. On April 17th one bomber was lost when its group was attacked by about two dozen Me 262s.

The bombers of the Eighth Air Force, who had suffered greatly at the hands of the Luftwaffe early in the war had their last encounter with the German fighters on April 19th. In well-timed attacks from the clouds, German jet fighters attacked and shot down six B-17s. Two of the attackers were shot down by Mustangs, but only after destroying three Fortresses in one very accurate pass.

Another four Me 262s were destroyed and three damaged when Mustangs from the 357th Group ambushed them from up-sun just after they had taken off. Elsewhere, the 364th tangled with four FW 190s and shot them down along with a Do 217 twin-engine bomber that tried to dive on them.

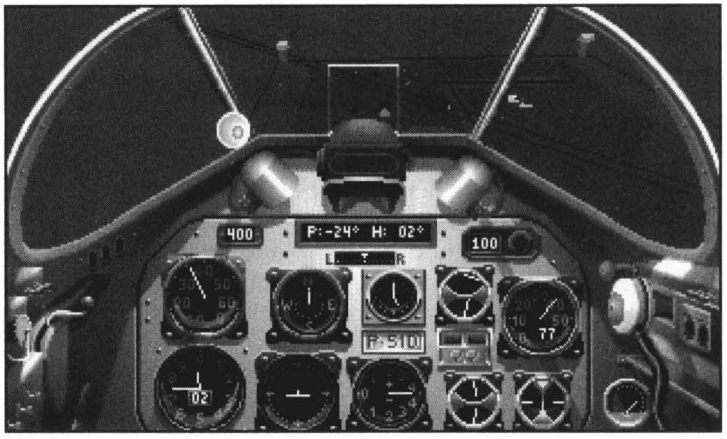
APRIL 19, 1945 MISSIONS

P-51D MISSION 2

Attack Me 262s Taking Off.

Careful study of the combat performance characteristics of the Me 262 jet revealed that it was most vulnerable during take-off and landing. The Eighth Air Force subsequently developed the tactic of sending fighters ahead of the bomber stream to catch the jets taking off from likely airfields. This tactic paid off on April 19, 1945, when Lt. Col. Jack

Hayes led a part of the 357th FG toward Prague airfield. Using the sun to his advantage, Hayes began circling to the south. Soon, numerous pairs of Me 262s took off and the Mustangs, using their altitude advantage, dove on the unsuspecting jets. The P-51s shot down four and damaged three of the jets before they used their superior speed to pull away.



Your Mission

Fly just south of Prague airfield, and follow Lt. Col. Jack Hayes and his wingman in to dive on the jets taking off. Watch for other enemy aircraft flying defensive top-cover for the jets.

Strategy

The priority in this mission is the Me 262s. Follow the aircraft in front and hit the Me 262s before they pick up altitude and speed. Once the first wave of Me 262s has been destroyed, stay close to the airfield and keep an eye out for the second wave of Me 262s about to take off.

FW 190 MISSION 1

Defend Me 262s Taking Off

This is the same operation as P-51D Mission 2

Your Mission

You and your wingman are flying cover over Prague airfield while 4 Me 262s take off below. Protect the jets from marauding American P-51 Mustang fighters. If you can tie them up, the Me 262s will have a better chance of flying to safety.

Strategy

There are two pairs of P-51s attacking in this mission. As soon as you shoot down the first pair, another pair show up. This will continue so long as you keep shooting down the

first pair. Instead, scare off the first pair by shooting at them and go for the second pair. Refer to the map often to see the location of the enemy fighters. Once the Me 262s are off the ground, they'll attack the P-51s as well.

ME 262 MISSION 1

Scramble from Prague

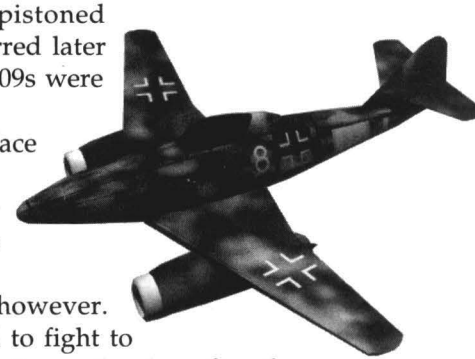
This is the same operation as P-51D Mission 2

Your Mission

You and three other Me 262s are on the runway at Prague airfield. Get airborne as quickly as possible to avoid the strafing fire of the American P-51s diving on your field. Once in the air, try to gain sufficient speed and altitude to engage the Americans. There are two FW 190s flying top cover for your airfield.

Strategy

Get off the ground quickly and make level steep turns until your aircraft picks up speed. In this mission, the P-51s have the advantage of diving and strafing. Make sure you have sufficient speed before you engage them. Since there are FW 190s flying top cover, make sure you are shooting at the enemy and not your own aircraft. Refer to the map often to see the location of the enemy fighters.



The final encounter between the Luftwaffe's pistoned fighters and the fighters of the Mighty Eighth occurred later that day over Czechoslovakia when 7 out of 12 Me 109s were destroyed by the Mustangs of the 355th Group.

The last bombing mission by the Eighth took place on April 25th when the bombers were sent out after targets in Czechoslovakia. The next day, the American and Russian troops met at the Elbe, and the war was over except for the mopping up.

Not everyone was ready to give up the fight, however. Adolf Galland and his JV 44 pilots were determined to fight to the end, despite the hopelessness of their situation. So on the day after the Soviets and the Americans met, Galland was back in the air with those of his pilots who felt the same way. They found a group of B-26 Marauders and went in for the attack. However, in his agitation, Galland must have been less than himself. On his run toward his first target, he forgot to release the second catch on his rockets, and missed the moment. However, he did fire with his

3 cm. cannons and passed by the first bomber to attack a second. Then he turned away from the group to assess the damage he had done, but he had gotten careless for just a moment. He hadn't spotted the Mustang who bounced him until it was too late.

Injured in the knee and with his plane in trouble, the only thing Galland could think at first was to bail out, but then he got the plane under control and was able to get it safely down to the nearby airfield. Unfortunately, the airfield itself was under attack by P-47s, and the great general of the Luftwaffe, one moment in the pilot's seat of the most advanced plane of the war, was the next moment cowering in a bomb crater. Soon he was rescued by one of the ground crew in an armored vehicle, but that was the end of the war for perhaps the Luftwaffe's greatest personage. Galland spent the remaining days of the war in a hospital. And his beloved Me 262s were mostly destroyed by their own pilots and crew to prevent them falling into the enemy's hands.

APRIL 26, 1945 MISSION

P-47 MISSION 6

Face off with ME262s

By the later stages of the war, American fighter pilots were eager to prove themselves, especially against the top German aircraft, the Me 262s. The German jet fighters were considered a top prize, but because of their great speed they proved to be a tough and elusive adversary. Generally an American pilot's best chance of bagging an Me 262 was to catch one taking off or landing. Rarely, an American pilot could translate an altitude advantage such that he could bounce the 262 before it had a chance to escape. Adolf Galland, commander of Jagdverband 44 and former head of the Luftwaffe's fighter arm, was shot down in his Me 262 by James Finnegan on April 26, 1945. Finnegan used the great diving capability of his P-47 to bounce Galland from high altitude and shoot him down.

Your Mission

While escorting a formation of B-17s, be on the look out for Me 262s. Fly ahead of the B-17s, gaining altitude, and orbit over the Erfurt airfield. A pair of Me 262s will be flying south toward the airfield. Bounce them from a high altitude. Other Me 262s will be landing at this same airfield. Beware of the FW 190s flying cover.

Strategy

As you reach the airfield, attack the Me 262s in the air first. Use your altitude to dive on the jets from above if they get below you. Once the Me 262s in the air have been dealt with, drop down to the airfield and attack the ones landing there.

OTHER APRIL MISSIONS

Attack on R&D Site

P-51D MISSION 7

Escort B-17s to R&D Site

Toward the end of the war, German research and development was still operating at a feverish pitch to complete ever more desperate secret weapons projects. Although Allied intelligence knew about much of the R&D that the Germans were conducting, these sites were nonetheless prime targets for bombing raids.

Your Mission

Flying P-51Ds, you and your wingman are to escort a formation of B-17s to bomb the research site at Gottingen. A nearby MEW (Microwave Early Warning) station reports that small formations of Luftwaffe interceptors are present between the bombers and the target.

Strategy

In this mission, you are escorting six B17s to the target. As you approach the target, FW 190s will attack you. Fire at them to break off their attack and proceed to the group of Gothas that are making their attack run at the bombers. Get your wingmen busy with the FW 190s by using the map and assigning them the FW 190s as the target.

B-17 MISSION 7

Bomb a Research Site

Toward the end of the war, German research and development was still operating at a feverish pitch to complete ever more desperate secret weapons projects. Although Allied intelligence knew about much of the R&D that the Germans were conducting, these sites were nonetheless prime targets for bombing raids.

Your Mission

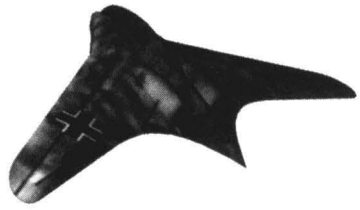
This is the same operation as P-51D Mission 7

Strategy

During this mission you'll encounter both FW 190s and Gothas. Keep scanning the skies for the enemy aircraft. A group of P-51s will approach from the north, with different

camouflage paint than the others. Be careful that you don't shoot down your own aircraft by mistake. Your bomber is a relatively easy target for the Gothas. Make sure you keep them away by firing early.

GOTHA 229 MISSION 4



Defend a Research Site

This is the same operation as P-51D Mission 7

Your Mission

You have been vectored to intercept a formation of B-17s headed for the Gottingen research site. Follow your flight leader as he takes you in to make a head-on attack. Use your Gotha's R4M rockets to damage or destroy a bomber on your first pass. Watch for Mustang escorts.

Strategy

The escort pilots protecting the bombers in this mission are excellent. Keep your speed high during your attack runs, and watch your turns and climbs. If you're not careful, too many maneuvers will slow your plane down, which makes you an easier target to hit.

GOTHA MISSION 2

Scramble from Ingolstadt

In April, 1945, as it became apparent that the war was drawing to close, Allied Air Forces achieved virtual control of European airspace. American P-51 Mustangs, with their incredible endurance, ranged over the majority of the Continent with increasing confidence and numbers. Also contributing to this freedom of mobility for American fighter pilots was the fact that the German war machine was quickly screeching to a halt. Fuel was becoming nonexistent, and experienced German fighter pilots were a rare breed.

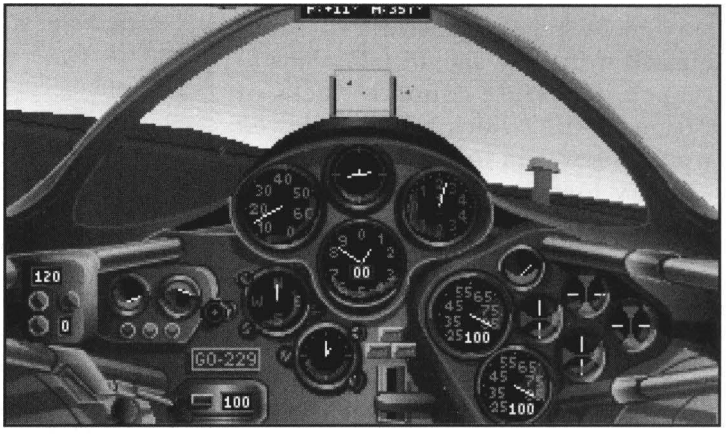
Had the Luftwaffe been able to build a quantity of Go 229s, they probably wouldn't have changed much about the outcome of the war. However, with a top speed of 170 mph faster than the P-51D, and an operational ceiling 10,500 feet higher, the Luftwaffe's flying wing would have been, at the very least, a challenging target for the aces of the Mighty Eighth.

Your Mission

As a flight of P-47s makes their attack run on your airfield, you and four other Go 229s are scrambling for air. Get flying as quickly as possible, and fight the attackers off. There will undoubtedly be more of them on the way.

Strategy

Get off the ground quickly, and dogfight as best you can. Try to keep the dogfight close to your home field for support from the anti-aircraft guns.



GOTHA MISSION 3

Attack on Bonn Airfield

As the Allies advanced across Europe, they captured many installations previously occupied by the Germans. Airfields were of particular strategic importance to both the Allies and the Germans. A variety of fighter missions could be launched against the Luftwaffe from Allied-held airfields in France, Belgium, and eventually Holland. Because of this, on numerous occasions the Luftwaffe attempted to disrupt the Allied installations established since D-Day.

Had the Gotha 229 seen active service before the end of the war, Allied air tacticians would have had a formidable new opponent. The Go 229s performance specifications outclassed every other aircraft operating in 1945. Able to carry a variety of ordnance types and fulfill a number of different roles, the Gotha certainly would have been the super plane of its day.

Your Mission

Flying a Gotha 229, follow your flight leader on a dive bombing and strafing attack on Bonn Airfield. Destroy as many of the parked aircraft and hangar buildings as possible. Your Gothas are armed with four 30-mm MK 103 cannons and two 2,205-lb. bombs each. Watch for enemy fighter cover above the field.

Strategy

As you approach the target field, watch out for the enemy fighter cover protecting the field. Your aircraft will evade rather than engage these fighters, so you'll have to do some dogfighting to protect them. Once the skies are clear you can begin your bomb run. Remember not to engage the enemy fighters near the airfield.

In the last days of the war, Hitler's stubbornness was matched only by the utter confusion of his responses. Within days he had announced plans to withdraw to the mountains, plans to stay in Berlin to the end and shoot himself if the city should fall, plans to launch desperate counterattacks of various kinds (which he still believed would allow him to win a war he had already lost), and so forth. He had Göring arrested after receiving a telegram that suggested that he (Göring) take over operations of Germany if Hitler were unable to continue. "If no reply is received by ten o'clock tonight," the telegram concluded, "I shall take it for granted that you have lost your freedom of action." He also ordered the arrest of General Karl Weidling for desertion. The general, who was even then defending Berlin, rushed to the bunker to assert his innocence, whereupon Hitler made him Battle Commandant of Berlin.

"We didn't buzz the field as they did on 'Twelve O'Clock High,' that sort of thing. They had so many guys buzz the base and run into the ground or a hangar, maybe kill themselves, that they decided that was not a good idea. I wasn't one of the buzzer types anyway. I do, however, remember I was taxiing in after landing, and I'm looking out the window and being 99 percent sure that my wing tip was going to miss this hangar and also feeling that I don't care if it doesn't. Sure enough, it hit the hangar and hung us up. There were fifty airplanes behind me waiting to taxi by and who's this ass on his last run who's got everybody backed up? Then I remembered this hot-shot little pilot that I had way back in Columbus, Ohio, teaching me formation flying, showed me how to back up a B-17. You'd hold the right brake and run up the number four engine so you're pivoting on the right wheel. Then you'd do the same with the left brake and run up the number one engine and pivot on the left wheel. So to the wonderment of everybody, I backed away from the hangar and taxied out." (from **High Honor**.)

On April 25, a single American soldier met a single Soviet soldier. The two forces opposing Germany had met, and the end of Germany's war was in sight. The Russians were marching deeper into the suburbs of Berlin each day. Meanwhile, Hitler learned of Himmler's negotiations and ordered him arrested. In Italy, on April 28, Mussolini was shot by Italian partisans. His body was hanged upside down the next day in Milan along with the body of his mistress, Clara Petacci. Later that day, the general of the German forces in Italy surrendered.

Russian soldiers enter the ruins of the Chancellory in Berlin.

Meanwhile, in his bunker, Hitler wrote his last political commentaries, expelled both Göring and Himmler from the Nazi party, and set up a government to succeed him. He blamed the war entirely on the Jews and continued to believe his warped racial policies to the end.

On the same day, the Dachau concentration camp was liberated. When the commander

handed over the camp to the Americans with a "Heil Hitler" and a snap of his polished boots, the American spit in his face and ordered him into a jeep. He handed the German's gun to one of the inmates and told him to come along, but the inmate was too weak to go. Later, the Americans, so thoroughly repulsed by what they saw, shot and killed all the SS officers and guards captured at Dachau. Journalists who went to the camp were overwhelmed with the sight of twisted corpses, train carloads of them, and the starving survivors. Of 2,539 Jews alive on the day of liberation, 2,466 died in the following month and a half.

At Yalta, the "big three" divided up the post-war world.

As April drew to a close, the main concerns for Churchill and the Allies were not so much the eventual defeat of Germany, which was assured, but the capture of territories before the Russians could capture them. Consequently, Churchill ordered his forces to move into Denmark and Linz in Austria. He also suggested, at a high level of secrecy, that the Western Allies move into the Stuttgart area before anyone else got there, pointing out that much of the German "Tube Alloy" (atom bomb) research had taken place in the area and it wouldn't do to let any secret papers fall into other hands.

In the end, it was with considerable distress that Churchill watched Stalin impose Russian rule on the Poles. He saw clearly that the stage had been set for the coming cold war, though its exact nature was perhaps still unfathomable. But he telegraphed Stalin saying, in part, "There is not much comfort in looking into a future where you and the countries you dominate, plus the Communist Parties in many other States, are all drawn up on one side, and those who rally to the English-speaking nations and their associates or Dominions are on the other. It is quite obvious that their quarrel would tear the world to pieces and that all of us leading men on either side who had anything to do with that would be shamed before history."

As the political situation became more and more paramount, the man who started it all took his last breath on April 30. After sending everyone from the room, Hitler stuck a gun in his mouth and pulled the trigger.

It was the end of Hitler, but the war dragged on a bit longer. On May 2, Marshal Zhukov accepted the formal surrender of Berlin. Meanwhile, many of the leading members of the Nazi movement followed Hitler's lead. Goebbels first had his six children killed by a lethal injection, then had an SS orderly shoot him and his wife. Martin Boormann was killed while trying to escape. General Krebs committed suicide, as did several others whose crimes made them afraid to face the world.

By May 7, Jodl was before Eisenhower, ready to surrender. He and Admiral Dönitz were the highest military authorities left. To the very last minute, the Germans attempted to pit the West

"...shamed before history."

against the East, saying that they would surrender only to the Western Allies, but would continue to wage war against the Russians. Knowing the ideological differences between the two forces, the Germans were ever hopeful that hostilities might erupt between them, but Eisenhower was adamant. Unconditional and complete surrender was the only option left to Germany. The surrender took effect the next day—on May 8, V-E Day. The war in Europe was over.

SOME STATISTICS

During the strategic bombing of Germany, the Eighth Air Force alone dropped 696,450 tons of bombs on the enemy. The RAF and the Fifteenth Air Force had added to that total. The devastation caused by the strategic bombing effort was immense, and the evidence was everywhere, from the bombed out factories to whole cities practically razed by fire storms.

Ironically, in the race between the 56th and the 4th, later assessments after the war led to revisions of their scores so that the 4th ended up with more victories than previously claimed—1,052 1/2 while the 56th was dropped to 985 1/2 from their previous claims of 1,005 1/2. However, the 56th still had two significant statistics in their favor. They had the highest total of air victories against the Luftwaffe at 674 1/2. Comparing their operational losses to those of the 4th, they were only about half of the 241 suffered by the more vulnerable Mustangs of the 4th Group.

Highest scoring fighter aces for the Eighth were Francis Gabreski (31) and Robert S. Johnson (28) in air combat. The highest scoring Mustang aces were George Preddy (25 1/2), John Myer (24), and Ray Wetmore (22 1/2). Donald Crossley was the undisputed champ of the bomber gunners with 12.

Chapter 21
The Air War in Retrospect

Professor Williamson Murray

Virtually nothing happened in the air war over Europe as the pre-war prophets of air power had predicted. That statement should not be surprising when one takes into account that neither naval nor land combat proved any easier to forecast in the pre-war period. What made the short fall between expectations and realities so noticeable was the fact that airmen regarded their weapons and doctrine as a guarantee of easy victory.

War in the air was governed by the same principles and rules that determined the outcome on the ground and at sea. Enemy air forces could interpose themselves between the attacking bombers and their targets, as Fighter Command was able to do during the Battle of Britain, and inflict an unacceptable level of punishment on the attacking forces. Air propagandists could claim that once bomber formations were dispatched, they never failed to attack their targets, but such an argument begs the real issue. While the Eighth Air Force successfully bombed Schweinfurt in August and October 1943, it is equally clear that its bombers could not return to the target for a substantial period of time, because the defending force had so successfully devastated the attacking formations.

The second major surprise of the air war had to do with the capacity of the modern industrial state and its population to absorb vast punishment and still function in an effective fashion. It is not that bombing makes workers more effective as some superficial critiques of the Combined Bomber offensive have suggested; rather modern industrial states, whether totalitarian or democratic, are capable of mobilizing manpower and resources in almost endless quantities. And when popular morale falters, modern industrialized states possess the requisite stiffening power to keep things in line.

THE ROLE OF THE CBO

The revealed wisdom of the academic community suggests that the Combined Bomber Offensive played a relatively unimportant role in the winning of World War II. This line of argument suggests that the opportunity costs of the bombing offensives were excessive. The

evidence, however, points in another direction. It suggests that the CBO should rank directly behind the Eastern Front when calculating the contributions of major campaigns to victory in the Second World War.

The contribution made by Bomber Command's "area" night attacks is difficult to measure in a quantitative sense. We can surmise that within the areas devastated by its attacks, substantial damage was done to German production. How much that production might have increased without the retarding effects of Bomber Command's attacks is impossible to estimate. What we can suggest is that a German economy, unburdened by such attacks, and drawing on the whole of Central and Western Europe, might have accomplished production totals close to those of the United States. Such a level of production would obviously have had a direct and appreciable influence on the battlefront.

We can, however, estimate Bomber Command's impact more closely in the realm of indirect cause and effect. The British attacks on German morale led the Nazi government to make two crucial errors in responding to the threat. On one hand, British night raids caused a substantial distortion in the production of artillery and ammunition. The German population drew confidence from the vast number of anti aircraft guns blasting away from their cities at the attackers. By summer 1943, no fewer than eighty-nine Flak batteries defended Berlin. The overall growth of the flak forces during the course of the war was phenomenal. From 791 batteries (88s, 105s, and 128s) in 1940, the number grew to 967 in 1941, 1,148 in 1942, and 2,132 in 1943; that growth represented an enormous investment in resources and manpower. The reader hardly needs reminding as to the impact that 10,000 anti aircraft guns (all highly capable in the anti tank role) might have had on the fighting on the Eastern Front or in Normandy.

The second indirect impact that the "area" bombing campaign had came in the reaction of the Nazi leadership to night-time attacks. Ironically, German leaders were the only ones to remain tied to a Douhetan air strategy throughout the war. Their reaction was not to ward off Allied air attacks by defensive measures, or to attack Allied bomber bases. Rather they aimed to strike back at terror attacks with terror. Hitler had warned his military aides shortly after the first substantial attack on Hamburg that "terror can only be broken with terror." Attacks on German air fields made no impression on him, he commented, but the smashing of the Reich's cities was another matter. It was the same thing with the enemy, he added. The German people demanded reprisals.

TERROR WEAPONS

Hitler's emphasis on retaliation rather than on air superiority resulted in the greatest German production error of the war. Both the army and the Luftwaffe in 1943 were about to produce retaliation weapons: the army, the V-2; the Luftwaffe, the V-1. The first represented a triumph of German engineering, but it was hardly a monument to good sense. As a weapon it demanded extremely complex technology (both in production and combat), it was expensive, it used scarce raw materials, and its production overloaded the industrial and electrical component industries. In the summer of 1943, German leaders faced the crucial choice of either radically restructuring the aircraft industry to insure day and night fighters in sufficient quantities or tro concentrate on

bomber production and the production of the new terror weapons. Unfortunately for Germany's cities, the Nazi leadership, particularly Hitler, was unwilling to meet the strategic bombing threat with a military response. As Góring commented to his staff in October 1943, the German people did not care whether the Luftwaffe attacked British airfields. "All they wished to hear when a hospital or children's home in Germany is destroyed is that we have destroyed the same in England; then they are satisfied."

The consequence of such attitudes was an emphasis on the V weapons programs that distorted the air defense programs throughout the last years of the war. Not only did these rocket programs prevent the development of an effective anti aircraft rocket, but they drained off significant resources from fighter production. After the war, the Strategic Bombing Survey estimated that the industrial effort and resources for those weapons in the last year and a half of the war equalled the production on no fewer than 24,000 fighter aircraft.

THE AMERICAN CAMPAIGN

The impact of the American effort is easier to access because it did have specific target sets against which the success of its efforts can be measured. In 1943 the two crucial target sets were ball bearings and aircraft production facilities. The attacks against the first failed for a number of reasons. Eighth Air Force was never in a position to deliver a sustained and consistent effort against the industry. Consequently, the Germans were able to rebuild the facilities at Schweinfurt, disperse production, increase imports from Sweden, and utilize alternatives such as roller bearings.

Attacks on German aircraft production in 1943 were more successful. The raids did not destroy the Luftwaffe's production base, but they created the preconditions necessary for gaining air superiority in 1944, while significantly retarding the production of new German fighters in the last half of the year. These American raids, while costly to the attackers, also imposed a high rate of attrition on the defenders.

The American air campaign in 1944 again had specific target sets, the attacks on which had specific, measurable results. For the first five months, the focus remained on the Luftwaffe and its industrial support. Then in May 19344 the focus shifted to attacks on the petroleum industry, which remained the major target for American bombers through to the end of the war. In both efforts American attacks achieved the desired effect, although in the first case as much through their indirect impact as through their direct results.

American attacks on the Luftwaffe's factories did achieve notable success, the critics of strategic bombing notwithstanding. Increases in German fighter production came almost entirely at the expense of bomber production. The number of fighters produced in 1944 did increase 55.9 percent form the previous year, but the weight of aircraft production rose only 22.9 percent. which reflects the diversion of production from bombers to lighter fighters. Moreover, the quality of the aircraft produced by German industry over the course of the year underwent a significant decline.

The indirect impact of American strategic bombing was no less impressive. The Germans clearly recognized that this offensive aimed to destroy the Luftwaffe's capacity to fight.

Consequently, Luftwaffe fighters had to come up to protect their service's future. There in the skies over the Reich, American long-range escort fighters broke the back of German air power in air battles that lasted from February to May 12944. That contribution gained the Allies air superiority over the European Continent with two crucial benefits: it allowed the daylight bombing of Germany to continue with relatively low losses for the remainder of the war, and it made possible the Normandy landings with no interference from the Luftwaffe.

The oil attacks also had significant direct and indirect effects and placed enormous impediments in the way of German military operations. They directly impacted on the Luftwaffe's capacity to conduct air operations; even more importantly they forced the Luftwaffe to reduce the number of flying hours that it provided for its new fighter pilots, making them even less capable of defending themselves. The impact on ground operations was also dramatic. Without sufficient petroleum German ground units could not maneuver in the same fashion as in earlier years. The German offensive in the Ardennes in December 1944 had only sufficient fuel to take it half way to its objectives; one month later the Germans possessed 1,800 tanks to defend the province of Silesia, but those tanks were immobilized with no available fuel supplies. Consequently, Silesia fell to the attacking Soviet forces in less than a week and without heavy losses.

SLEDGEHAMMER BLOWS

Strategic bombing's greatest contribution came in the last months of the war. In 1944 and 1945 three gigantic sledgehammer blows hit the German nation. The first two of those—the "area" bombing attacks and the oil campaign—we have just discussed. The most crucial effort came with a massive effort by both tactical and strategic air forces to destroy the German transportation network. That effort could not prevent the Germans from making a last stand on their frontiers in fall and winter 1944/1945. Nor could it prevent the Germans from assembling their reequipped forces for the desperate Ardennes offensive in December 1944. But by the end of the year it was well on the way to shutting down the German economy. By the end of January 1945 German industry was in a state of collapse with dramatic declines of production in all sectors. And even the weapons and ammunition that were produced were not getting through to the troops. Movement on the railways and waterways of the Reich ceased, and the armies, starved for munitions and weapons, collapsed. Thus, there was no Götterdamerung in fighting over the shells of what had once been Germany's cities to prolong the war and kill millions more. Even the most fanatical troops with no weapons and ammunition are generally in no state to carry on the struggle.

As the above suggests, strategic bombing was crucial to victory over Nazi Germany. In fact, victory in Europe is equally inconceivable without the contribution of Allied navies over the U-boat menace in the Atlantic, of the Red Army on the Eastern Front, or Allied ground forces in the great invasion. And therein lies much of the problem in estimating the contribution of air power in the war. By claiming so much before the war (and after the war as well), airmen created false perceptions that the documentary and historical evidence simply does not support. The strategic bombing offensives contributed to Allied victory because they supported and were supported by

the results achieved by the other services. Nevertheless, without those great offensives Allied victory, unless purchased at far higher cost and over a much longer period of time, is simply inconceivable.

The cost of those air campaigns was high indeed. Our historical memories are conditioned by the disastrous raids against Schweinfurt (sixty B-17s lost on each) and Nuremburg (108 bombers lost by the RAF's Bomber Command). But the day in and day out conduct of air operations over the European continent occasioned a truly terrifying rate of attrition even for the victors. With hindsight we can argue that the Combined Bomber Offensive was often waged in an unimaginative fashion, that air forces failed to adapt to changing tactical and technological conditions, and that the possible contributions of air power were often minimized rather than maximized. But are not these the conditions under which all wars are fought? Certainly Bomber Command might have increased the effectiveness of the transportation and oil plans after September 1944, if it had abandoned Harris' fixation on "area" bombing. What is sure is that the Combined Bomber Offensive was crucial to the defeat of Nazi Germany. It was not elegant, it was not pretty, but it was effective.

Chapter 22
SWOTL Campaign & Tour of Duty Strategies

A GENERAL TIP

Always make a backup of your campaign by copying it to a backup file in case you really screw up during a campaign and don't want to start over.

AMERICAN SIDE

The first priority at the beginning of each campaign is to crush the Luftwaffe air defenses so that the bombers can attack the critical targets unopposed later on in the campaign.

In order to do this, you must first pick the airbases you wish to bomb from the map. Your choices should be airbases that are close to England and that contain fighter *gruppen*. This is good safety measure because resistance is bound to be high in the first few missions, and if you get into trouble you can always find your way back across the channel to your home field. A good combination for your primary attack group is 4 bombers and three fighter escorts as top cover. The beginning point of your primary group should be as close as the target is possible to save time and resources.

Your secondary groups, which are established by clicking on the enemy target and then clicking again on # OF BG (how many bomb groups), # OF FG (how many fighters will protect the bombers), or # OF GROUND ATTACK (how many fighter/bombers). Again in the beginning of the campaign the secondary missions should be devoted to the enemy airbases. If you run out of nearby bases that have enemy aircraft, then select any Luftwaffe airfield.

Your secondary groups should consist of 3 bomb groups and one fighter escort. The number of groups you have available will determine how many secondary targets you can establish. This number will grow during the course of the campaign as more and different types of aircraft become available. You can also establish some of the fighter groups to be fighter/bombers. You do this by selecting # OF GROUND ATTACK on the enemy target. Usually these groups are not as effective as a bomb group, but they do some damage, so spread them around on the not-so-critical targets. Usually one or two groups per target is sufficient.

If you're unsure about the target you're attacking as the primary group or you're unsure about your abilities, then do not establish secondary targets. Your success or failure as the primary group player will determine how the secondary groups perform. If you have intermediate bombing or fighter skills then don't establish secondary targets in the very first mission. Fly the mission first and get used to it. Hopefully you'll do some damage which will soften up the resistance a bit. Then fly the same target again in the second mission and this time establish your secondary targets.

It's imperative that some damage occur to the target in each mission. One way to insure this if you are flying as fighter escort is to load a 2000 lb bomb on the fighter at the start of the mission. If the bombers get shot down, you can go in and dive bomb one of the buildings at the target and hopefully destroy it. This will insure that the secondary groups do at least some damage to their targets.

Once you fly enough missions and reduce the Luftwaffe forces sufficently (50%-%60) then select targets that will help you win the campaign, i.e. oil refineries, factories, transportation, etc. You should establish bomb groups to attack a variety of industries to reduce the production across the board rather than in one area. The long and difficult missions are best left to the secondary groups, while you continue to fly against close, easy targets. Always remember to send at least one group to attack a Luftwaffe base in each mission. This will help keep the Luftwaffe off balance.

GERMAN STRATEGIES

In all three scenarios the strategy is fairly straightforward: Stop the bombers and fighter/bombers.

Set all the available planes at the beginning of each mission to attack the bombers or fighter/bombers. Don't waste resources trying to knock out the escorts. If the resistance from the fighter escorts is really heavy then you attack them while the other planes attack the bombers. Your role on the German side is strictly defensive. Don't attempt to launch offensive attacks against the Americans. Once additional planes become available in reserve, assign them immediately to airfields that are near valuable resources like the major oil refineries, and factories. These airfields should be empty as well. Spread out your defenses.

As rule of thumb, it's never wise to disperse a factory unless it's getting bombed. It sets production way back if you arbitrarily disperse factories during the course of the campaign.

Set your research sites to develop weapons or planes you need or want to fly. Start gearing your refineries and factories to produce for the new technology once it becomes available. For example, if the Me 262 will become available for use in 16 days, then you should start setting some of your refineries to producing jet fuel. Once the planes are available then start producing the fighter in your factories. If you really like flying jets, then set all your factories to producing this new weapon—including engine and aircraft factories.

In the first two scenarios, V weapons will become available at some point during the campaign. Once they do, set the V weapon launch sites to fire three missiles at 12:00. You may not want to fire all your reserves in one mission, but you can safely fire, say, 80% of your resources. You get better results by launching many at a time rather than a few here and there.

Remember to keep flying during a mission that has V weapons set to launch. If you quit the mission prematurely not all of the missiles will get launched. Fly around your airfield and check the map to see the status of your V weapons.

THE TOUR OF DUTY

Playing the Tour of Duty in *Secret Weapons of the Luftwaffe* is both a matter of survival and of personal advancement. The idea is to start out as a raw recruit, jump in the aircraft of your choice, and try to survive the number of missions needed before you can retire. The missions are somewhat random and the strategy for completing them is the same as the strategy for completing any mission. If you know how to dogfight enemy fighters and shoot down enemy bombers, then you should be able to complete the missions. The idea here is not to be a hero, but to stay alive and try to achieve the mission objectives. For instance, if your job is to escort B-17s in a Mustang, it's more important to prevent the bombers from being damaged and aborting the mission than it is to shoot down a lot of enemy planes. On the other hand, the more damage you can do, the higher will be your ultimate score.

Although we can't tell you much about each individual mission, there are a few tricks that will work to get you a higher score. The most useful way to boost your score is to shoot or bomb buildings after you complete the current mission. Often, for instance, we may equip our aircraft with drop tanks, even if the action is near our home base, to allow us to fly to a nearby enemy installation and wreak some havoc there before returning to our base. Master the skills of bombing and ground strafing and you'll be able to destroy as many as eight or ten buildings in a single mission. Your scores will skyrocket, and so will your rank. And your medal case will fill up as well.

Always try to land at your home airfield. Your score will be greater if you do. Also, if you have a cannon-equipped aircraft, you can destroy buildings on the ground with just a few shots. One technique we have tried is to be very careful with out shots during the mission, saving as many cannon rounds and rockets as we can, then going in for a frenzy of ground destruction.

The best targets are the oil facilities. The oil tanks themselves only take a few shots to ignite, and they have the added benefit of occasionally causing chain reactions that may allow you to destroy more than one building at once.

If you're going to have to fly a long distance to get to an enemy ground target, you should always check your fuel before you leave. Sometimes during the mission, one or more of your fuel tanks may get a hole in it. It may seem to be full, but as soon as you fly for a while, it will quickly empty itself and leave you literally high and dry. Before starting on a long flight, cycle through your fuel tanks. Usually there will be one or two tanks you haven't used. For instance, if you are using your drop tanks, then you will have main tanks, and possibly auxilliary tanks, in reserve. As you cycle through, check to see if any reserve tanks are registering less than full. Even a slight dip in the reading probably means that the tank has been shot. Don't rely on that one!

If you're playing the German side and the Allies have sent fighter/bombers, you need to figure out which ones are the escorts and which ones have the bombs. One way is to engage them. The ones with the bombs will not get into a turning duel with you. They'll try to evade and return to their course. Also, they may be flying lower than the escort. If you find yourself in a

turning duel with a fighter in such a mission, you'd better peel off and go after the ones with the bombs before it's too late. Of course, in B-17 missions, it's easier to figure out what to shoot.

Here's another tip, and this one's good for regular missions, too. If you can damage an oncoming bomber, it will drop out of formation. Now, resist the temptation to finish it off right away. It will probably not be able to complete its mission. So go after the healthy aircraft first, then you can catch up with any stragglers later.

One strange event we've noticed is that sometimes, during Luftwaffe tours of duty, your home airfield will actually appear with an American flag on it. If you try to land there, the anti-aircraft gunners will shoot at you. Nice! It's a small bug, and the only thing you can do is go land at a friendly Luftwaffe base. You don't get your home field landing credit, but you don't get shot at, either.

Playing in the Moderate level is pretty easy. You start close to your goal or enemy and the opposition is not particularly difficult. Also, you don't have to fly as many missions as you would in the more difficult levels of play. On the other hand, you can gain points (and therefore rank and glory) quicker in the more difficult levels of play because pilots at higher levels of opposition are worth more points.

All other scoring considerations are the same as for the historical missions. See the chapter on SWOTL Scoring.

Chapter 23
Inside SWOTL

NOTES ON THE EXPERT MODE

If you're really a good pilot, you'll want to use the Expert Mode. This mode will provide plenty of challenge for those who might be looking for something more.

Differences from Normal Flight controls

- Rudder control giving plan yaw
- Ordnance affecting handling of plane
- Ordnance affecting speed, climb and ceiling of plane
- Landing on runway required for successful touchdown
- Safe parachute altitude at 500 feet instead of 200 feet for normal
- Flaps, landing gear, and flight controls can be damaged by excess speed
- Information on briefing and inflight map restricted to what is nearby friendly aircraft, and not all aircraft as in normal flight

MANEUVERS THAT AI PLANES USE

The pilots you fly against in SWOTL are always thinking. Well, not really. But they do have a set of reactions based on the circumstances. Here are some guidelines which may or may not help you succeed in the air.

Evasive Maneuvers vary with plane. The first question the AI pilot asks himself is, "Where is the attacker? Is he above me, level with me, or below me?" Then he will pick a maneuver based on other information. There are seven basic evasive tactics used by the AI pilots.

Evasive Maneuvers	Attack Maneuvers
1) Turn Inside	(executed from above, level or below)
2) Split S (German 190 or 109)	1) Head on
3) Immelmann	2) Stern
4) Scissors	3) Side
5) Zoom	
6) Dive	
7) Throttle up, pull away	

Given these seven evasive maneuvers (and three attacks), here are some of the other factors that affect the pilot's decision:

- If the attacker is flying a P-47, don't dive. (Also depends on the experience of the pilot.)
- If the attack is from above, then use maneuver 1, 3 or 5.
- If the attacker is level, from what quadrant is he coming?

  If the level attack is from the side, then use maneuver 1 (Turn Inside).

  If the level attack is from head-on, either counter with a Head-On attack, or 5 or 6.

  If the level attack is from astern, or if his aircraft is faster, use 7, 2, 6 , 3, or 5.

SCORING FOR SWOTL

Points scored for downing a plane:		For ground targets:	
Bf 109	15 points	**Bomb hit:**	15 points
FW 190	16 points	**Rocket hit:**	15 points
Me 262	25 points	**Strafe hit:**	1 point/10 hits
Me 163	20 points	**Building destroyed:**	30 points
Go 229	30 points		
P-47	20 points		
P-51B	25 points		
P-51D	25 points		
B-17	40 points		

- If the pilot is a TOP ACE, * 200%
- If pilot is an ACE, * 150%
- If plane was non-evading (FORMATION FLYING), point value is 50%

- Planes in same bombing flight group contribute 20% of their points to all other planes in group.
- Planes that are escorting bombers get 40% of the bomb totals added to their scores.
- Planes that are intercepting bombers have 25% of the ground target hits points subtracted for each plane that is successful in its bombing run.

*** *The steeple of a church is indestructible.* ***

Points subtracted:

If you or flight leader is shot down:	10 points
If you lose a plane you're escorting:	20 points
If your plane is shot down:	40 points
If you shoot down a friendly plane:	100 points

Bonus points:

Normal Flight Controls Land Bonus:	25 points
Advanced Flight Controls Land Bonus:	50 points
Mission Completion Bonus:	75 points

MEDALS AND RANKS

Luftwaffe ranks:

Leutnant	0 (new pilot)
Oberleutnant	500
Hauptmann	1500
Major	2500
Oberstleutnant	4000
Oberst	8000
Generalmajor	14,000

The last three ranks (Generalleutnant, General, Generaloberst) were rarely if ever awarded to active pilots and were reserved for ground commanders, hence are NOT possible in SWOTL.

Luftwaffe medals:

Iron Cross Second Class	1000
Iron Cross First Class	2000
German Cross in Gold	3000
Knight's Cross	5000
Knight's Cross with Oak Leaves	6000
Knight's Cross with Oak Leaves and Swords	10,000
Knight's Cross with Oak Leaves, Swords and Diamonds	12,000
Knight's Cross with Golden Swords, Oak Leaves and Diamonds	16,000

Two medals described in the manual can NOT be won: The Wound Badge (pg. 143) and the Grand Cross (pg. 141). The Grand Cross was awarded only to Göring.

American Ranks:

2nd Lieutenant	0 (new pilot)
1st Lieutenant	500
Captain	1,500
Major	2,500
Lieutenant Colonel	3,000
Colonel	6,000
Brigadier General	12,000

The top three ranks (Major General, Lieutenant General, General) like the Luftwaffe, were reserved for top ground commanders and cannot be achieved in SWOTL.

American medals:

Purple Heart (and wounded (meaning damaged plane))	1,000
Air Medal	2,000
Distinguished Flying Cross	4,000
Silver Star	5,000
Distinguished Service Medal	8,000
Distinguished Service Cross	10,000
Congressional Medal of Honor	14,000

TARGET LIST FOR SWOTL

Legend:
Target = Name of Target
Out = Maximum Output Level
Rebuild = Time to Rebuild

No	Target	Out	Rebuild
Oil Targets			
0	Regensburg	50	31
1	Ludwigshafen	50	35
2	Brux	60	25
3	Wesseling	100	30
4	Zeitz	50	35
5	Bohlen	133	30
6	Leuna	200	40
7	Duisburg	133	25
8	Lutzkendorf	115	30
9	Ruhland	50	20
10	Essen	90	35
11	Dortmund	100	30
12	Magdeburg	60	40
13	Bremen	66	30
14	Hamburg	133	45
15	Poelitz	66	25
Aircraft Factories			
16	Augsburg	200	100
17	Schwabisch Hall	75	80
18	Regensburg	200	95
19	Gotha	75	75
20	Kassel	66	90
21	Leipzig	133	100

No	Target	Out	Rebuild
22	Oschersleben	66	85
23	Brandenburg	83	90
24	Johannisthal	100	80
25	Bremen	166	110
26	Wismar	66	70
27	Warnemunde	66	90
Engine Factories			
28	Munich	88	35
29	Altenbuena	100	30
30	Kothen	45	35
31	Dessau	150	30
32	Magdeburg	150	40
33	Brunswick	112	35
34	Marlenfelde	200	30
35	Genshagen	250	40
36	Spandau	200	45
37	Basdorf	150	35
38	Kiel	100	20
R&D Sites			
39	Lechfeld	150	108
40	Augsburg	100	85
41	Gottingen	50	100
42	Peenemunde	250	125
Railway Centers			
43	Munich	45	55
44	Juvisy-sur-Orge	50	40
45	Saarbrucken	75	50
46	Rouen	50	40
47	Mannheim	100	60
48	Mainz	112	70
49	Frankfurt	125	75
50	Koblenz	125	60
51	Cologne	125	70
52	Kassel	88	55
53	Leipzig	100	60
54	Schwerte	175	40
55	Magdeburg	100	65
56	Hanover	125	55
V1 Sites			
57	Pays de Caux	100	120
58	Canche	100	140
59	Calais	100	150
60	Wateringues	100	130
61	Nieuwpoort	100	135
62	Peenemunde	100	150

No	Target	Out	Rebuild
V2 Sites			
63	Bernay	100	160
64	Vexin	100	140
65	Creil	100	180
66	Pays de Bray	100	160
67	Amiens	100	170
68	Compienge	100	150
69	Peronne	100	100
70	Caudry	100	160
71	Arras	100	180
72	Lille	100	100
73	Ronse	100	80
74	Deinze	100	150
75	Watteren	100	190
76	Zelzate	100	150
77	Peenemunde	100	200
Ball Bearing Factories			
78	Steyr	12	50
79	Stuttgart	12	40
80	Schweinfurt	212	60
81	Berlin	25	65
Munitions Factory			
82	Stuttgart	50	70
83	Nurnberg	50	60
84	Mannheim	100	80
85	Frankfurt	100	90
86	Cologne	50	60
87	Dusseldorf	100	65
88	Kassel	50	85
89	Duisburg	100	70
90	Essen	120	85
91	Dortmund	120	60
92	Munster	100	90
93	Hanover	88	50
94	Berlin	120	100
95	Hamburg	110	75
96	Wilhelmshaven	75	65
97	Kiel	75	80
German Airfields			
98	Munich	100	130
99	Neubiberg	100	140
100	Evreux	100	100
101	Metz	100	130
102	Le Havre	100	150
103	Babenhausen	100	145

No	Target	Out	Rebuild
104	Liegecourt	100	125
105	Prague	100	115
106	Wevelghem	100	140
107	Bonn	100	160
108	Venlo	100	130
109	Brandis	100	120
110	Woensdrecht	100	140
111	Quedlinburg	100	115
112	Deelen	100	140
113	Burg bei Magdeburg	100	130
114	Brandenberg	100	125
115	Wunstorf	100	115
116	Hopsten	100	105
117	Oranienburg	100	145
118	Varrelbusch	100	155
119	Leeuwarden	100	135
120	Oldenburg	100	125
121	Hamburg	100	110
122	Jeuer	100	130
123	Anklam	100	105
124	Nordholtz	100	90
125	Eggebeck	100	95
German Airfield 2			
126	Schleissheim	100	125
127	Roye	100	100
128	Paderborn	100	130
129	Ingolstadt	100	145
130	Beaumont le Roger	100	105
131	Meaux	100	115
132	Reims	100	100
133	Wiesbaden	100	120
134	Moorseele	100	110
135	Bassenheim	100	120
136	St. Omar	100	130
137	Haren	100	140
138	Erfurt	100	150
139	Zeist	100	140
140	Rheine	100	120
141	Osnabruck	100	130
142	Doberitz	100	160
143	Gardelegen	100	110
144	Achmer	100	130
145	Bremen	100	130
146	Bad Zwischenahn	100	150
147	Rechlin	100	180
148	Parchim	100	100
149	Neumunster	100	80
150	Husum	100	125
Home of the 4th Fighter Group			
151	Debden	100	100
Home of the 56th Fighter Group			
152	Boxted	100	110
Home of the 91st Bomber Group			
153	Bassingbourn	100	90
Home of the 78th Fighter Group			
154	Duxford	100	100
Home of the 385th Bomber Group			
155	Great Ashfield	100	90
Home of the 310th Bomber Group			
156	Framlingham	100	100
Home of the 95th Bomber Group			
157	Horham	100	110
Home of the 357th Fighter Group			
158	Leiston	100	90
Home of the 379th Bomber Group			
159	Kimbolton	100	100
Home of the 100th Bomber Group			
160	Thorpe Abbotts	100	110
Other Targets			
East-West Bridge			
161	Strasbourg	100	30
162	Melun	100	35
163	Nanterre	100	25
164	Verdun	100	20
165	Metz	100	25
166	Speyer	100	30
167	Moldau	100	35
168	Hanau	100	30
169	Hammelburg	100	25
170	Andernach	100	25
171	Maastricht	100	30
172	Mechelen	100	35

No	Target	Out	Rebuild
173	Saale	100	30
174	Moers	100	35
175	Venlo	100	30
176	Bottrop	100	25
177	Arnhem	100	30
178	Hoxter	100	25
179	Magdeburg	100	30
180	Oder	100	25
181	Kostrzyn	100	30
182	Minden	100	35
183	Lemsterland	100	30
184	Ems	100	25
185	Aurich	100	45
186	Wedel	100	15
187	Warnemunde	100	20
North-South Bridge			
188	Passau	100	25
189	Ulm	100	15
190	Boulogne	100	25
191	Regensburg	100	35
192	Elbeuf	100	30
193	Kitzingen	100	25
194	Peronne	100	20
195	Somme	100	10
196	Kralupy	100	20
197	Frankfurt	100	50
198	La Louviere	100	25
199	Koblenz	100	40
200	Namur	100	25
201	Huy	100	30
202	Hasselt	100	35
203	Geel	100	28
204	Xanten	100	30
205	Heme	100	25
206	Witzenhausen	100	35
207	Willemstad	100	25
208	Nijmegen	100	20
209	Elbe	100	40
210	Meppel	100	35
211	Aller	100	25
212	Bremen	100	35
213	Hamburg	100	30
214	Poelitz	100	20
215	Itzehoe	100	15
216	Kiel	100	35

THE CARE AND FEEDING OF PILOTS

All three of the Lucasfilm historical flight simulations allow your pilots to progress—to have a career, more or less. It's up to you to make sure they are taken care of and that they reach the highest rank possible. Why? Simply because, at a higher rank, they will perform better in battle. Their aim will be a little sharper, their instincts a little better. Oh, and their chests will be covered with medals, if that matters to you.

The trick to succeeding in the harder scenarios in these games is to choose wingmen who are of an advanced skill level, but how do they get there? How did a lowly recruit make it to Captain or Oberst, or even better? In this section, you'll learn some of the basic tricks in the care and feeding of pilots.

Get Some Experience

The first thing your new pilot needs is experience, and the only way to obtain experience is to get into the air. So you can create a new pilot and immediately send him out against the best the enemy has to offer, or you can bring him up slowly. Tragically, many new pilots had the former experience, and were killed before they ever even upacked their trunks at their new base. You can be kinder to your pilots than either the RAF or the Luftwaffe was able to be.

Perhaps the best way to bring a pilot up slowly is to use the Custom Mission Builder to create an easy mission—a cakewalk for your new recruit. Check out Appendix B to learn more about creating custom missions. You can create any kind of mission you want. Make it easy or make it challenging. For building your pilot, however, you should probably make it pretty easy; perhaps a couple of bombers with no escort

or maybe a ground strafing mission where you start your mission near some good targets and not to far away from home. You can get some pretty good scores by strafing ground targets in SWOTL, though, if you're playing the Allied side, watch out for flak!

Of course, you may fly the same pilot for a long time, but there's always that black day when he gets shot down and killed. It's part of the game, just as it was part of the real war. Fortunately for you, there is a way to prevent total disaster. This is a game, after all. You'll have to quit the game, but at the DOS prompt y ou can find the file that represents your pilot. If you list the \SWOTL directory, you'll see your pilot's name followed by an extension that represents the kind side he's on. For instance, if your pilot is MAX and he flies for the Allies, then his pilot file will be called MAX.USA. German pilots have the extension .GER.

To back up your pilot file, simply use the DOS Copy command. For instance, type Copy MAX.USA MAX.BK1. That copies your pilot's file to a different one with the extension .BK1. If something bad happens, simply copy that file back to the original name, and you'll have resurrected your pilot.

With some experimentation, you may find that pilots from one side can be copied to another kind. For instance, an ace Me 262 pilot could be turned into a Mustang ace by copying his file to a new name with the.USA extension.

Then there is the clone feature. Well, not really a feature. But you can simply copy any good pilot to different names. Instantly, you'll have a whole flight group or *gruppe* of great pilots to use as wingmen. As you probably already know by now, good wingmen and support pilots and crew can be a big help. They shoot straighter, think quicker, and die less often. Most people do clone their best pilot to use in the mission. You can give the pilots any name you wish (as long is it fits into the DOS name structure). This is basically true of other versions of the program as well.

A FLYING TIP

Having trouble beating the enemy? Try this. Let him come up on your tail, then go into a steep climb. He won't follow you. Look behind you as you climb and watch where he goes. If he goes straight ahead, wait a second, then dive down on him and shoot away! If he turns, push down your nose and turn in the direction he went. In most cases, you'll be right on his tail, and you know what to do then.

Appendix A
The Gun Cameras

Fighter aircraft in particular often carried movie cameras in the nose. The camera was synchronized with the firing of the aircraft's guns and would provide a record of killed and damaged enemy planes. In the heat of battle, the accuracy of claims was often poor since several pilots might be shooting at the same enemy in a wide-open dogfight. Therefore, the gun camera helped confirm the results of combat.

In these three simulations from Lucasfilm Games, the gun camera is even more useful. You can use it to review your combat experiences, positioning yourself anywhere in the battle. Moreover, the camera is not limited to recording only when your guns are firing. You get to see all the action from the time you turn the camera on to the time it runs out of film or you turn it off again.

The camera is especially useful for analyzing your shooting and strategy. How far off was your deflection shooting? Why did you lose that bogey in a tight turn? What are the enemy's tactics and how can you gain an advantage? Who was that guy who shot you and where did he come from?

The gun camera has changed quite a bit from one game to the next. In the following section, we'll give you some information about how and when you can use the camera feature in each game.

BATTLEHAWKS 1942

In Battlehawks, the gun camera is very simple to use. You turn it on by pressing C. It only records for a short time, however. Any time during a flight, you can replay the movie you've made, then return to the active mission. To see the movie, press R. However, you can't see the movie after the mission is over, you've been shot down, or you've bailed out.

While in the replay mode, you can use the keyboard and your mouse or joystick to control what you see.

- Press the Left Button or the Spacebar to move forward at a constant altitude.
- Move side to side on the mouse or joystick to pan right and left, up or down.
- Press + to raise the camera.

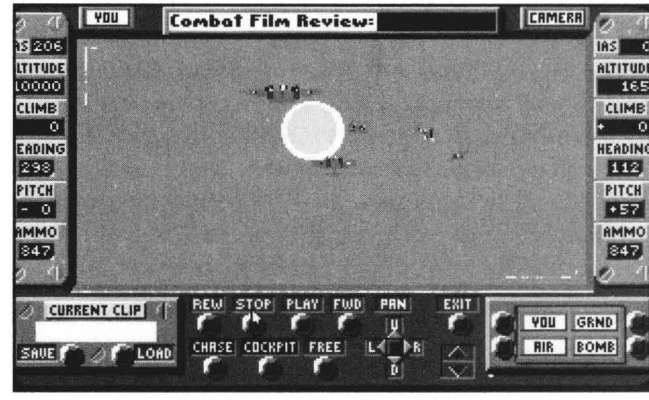
- Press - to lower the camera.
- Press R to position your view at the current position of your plane.
- Press F to return to your mission.

The advantage of this replay camera is that you can step out of the action at any time, see what's going on, then jump back in. Plenty of pilots would love to have that ability! Unfortunately, however, you can't save your exploits for posterity. You get to see the film as many times as you wish, but once the mission is over, the film is gone. Also remember that each time you restart the camera mode, it erases any previous movie you've made. The motto of this gun camera replay would seem to be "get it while you can."

THEIR FINEST HOUR

The camera replay for Their Finest Hour is more complex than its counterpart in Battlehawks. Now you have additional features to enhance your battle review, including watching the action from other perspectives and saving your film clip.

The Camera Replay screen look pretty complex at first, but it's simpler than it appears.



The view of attacking bombers, from the ground.

- At the top of the screen you'll see the name of the plane or object to which the camera is currently attached. The camera can be attached to almost any object in the battle area, including enemy planes, parachutes, barrage balloons, ground targets, or even dropping bombs.
- On both sides of the screen you'll see a list of numeric data relating to the position, speed and condition of your aircraft (on the left), and the camera position itself (on the right). You'll soon see that the camera can be attached to almost any object in the battle zone. Information includes:

  IAS (Indicated Air Speed): The speed at which your plane/the camera is moving.

  Altitude: The current altitude of the plane/camera.

  Rate of Climb (as + or -)**:** The rate of ascent or descent of the plane/camera.

  Heading: The current direction of your plane/camera.

  Pitch: The angle of the plane/camera relative to the horizon.

  Ammo: The amount of ammunition remaining in your plane/the camera (if appropriate).

- At the bottom of the screen is a bank of buttons for controlling the information you see. These buttons are arranged in three main groups—The **Save/Load** controls, the **Playback/Position** controls, and the **Target** controls.

Save/Load

The Save/Load controls consist of two buttons, one for Save and one for Load. You may save any current filmclip by first typing a name in the white box above the Save/Load buttons, then pressing the Save button. To retrieve a previously saved clip, press Load and choose the one you want. You can't load any other film clip when you are viewing the replay during a flight, but you can save your current clip during flight, return to the action and restart the camera, then return to the Camera Replay to save another clip.

Playback/Position

The top row of the Playback/Position buttons consists of four VCR-like buttons. In order, from left to right, these will Rewind, Stop, Play, and Forward your current clip. There is no incremental Rewind control, however. Rewind simply takes the film back to the beginning. On the other hand, Forward (FWD) advances the film a frame at a time. This is a good way to get a sort of stop-motion effect to analyze a sequence of events carefully. Since there is no slow motion mode, this is the best substitute. Of course the functions of both Play and Stop are obvious.

Beneath and to the right of the VCR controls are the Position controls. The buttons allow you to view the action from one of three places.

- The **Chase** mode positions the camera behind your plane so that you can watch the action from outside the cockpit. This is a good way to see what your maneuvers really look like. Since the instrument panel isn't in the way, and you can see how your wings dip in turns, how you position yourself relative to the enemy and many other details, the Chase mode is one of the most useful.
- The **Cockpit** mode shows you what your mission looked like from inside the plane, but with the instrument panel removed, providing a greater field of vision.
- Finally, the **Free** mode simply positions the camera in a specific location and allows you to change its viewpoint using the Pan and Zoom controls to the right of the buttons.

Pan Controls

The Pan controls work only in the Free mode. Using them you can move the camera view to the right or left, up or down. You can also zoom in and out by pressing the red button in the middle of the four pan controls. You'll often be amazed if you stop the action at a particular moment and pan a full 360 degrees. Suddenly whole new panoramas unfold before you! Remember, when you are in the Free mode, the camera stays in one place and simply spins around. If you want to use a keyboard to pan, press the Enter key with the cursor over the pan control you want to use.

- The red button in the middle of the Pan controls is called the **Zoom** button. With a mouse or joystick, you can zoom in with one button and zoom out with the other.
- Next to the Pan/Zoom controls are the **Exit** button, which lets you leave the Camera Replay; and the Up and Down arrows, which let you change the camera's altitude, but

only in the Free mode. If the action is taking place at 20,000 feet and the camera is at 5,000, you can use these arrows to place the view where it will do the most good.

Target Controls

Finally, there are the Target controls which let you choose which object will 'carry' the camera. The four choices are:

- **You:** Positions the camera on your plane. In the Free mode, the camera will be positioned at your plane's current location, but will remain there while your plane zooms off into the action. This is a dramatic way to see what you are doing, and you can keep pressing the You button to relocate the camera, or (in Free mode) use the Pan and Zoom buttons to keep your plane in sight.
- **Air:** Selects any object currently in the air. Press repeatedly to toggle through each available airborne object. This includes all planes (friendly or unfriendly), barrage balloons, and parachutes.
- **Ground** (GRND): If there are ground targets in the mission, you can view the action from them. This is an excellent way to assess your approach on bombing missions. It's also a good vantage point from which to watch your attempts to intercept bombers close to the target (which several missions require you to do).
- **Bomb:** If bombs are in the air, and you've got a sort of second-hand death wish, you can, in effect, ride them down and see just where they land. It's a short ride, but thrilling nevertheless.

SECRET WEAPONS OF THE LUFTWAFFE

Once again, the Replay Camera has undergone some changes. Perhaps the biggest improvement is that you can now save very long clips, depending on available disk space. Also, zooming and panning are now under joystick or mouse control. As you view your film, simply press the left or right buttons to zoom and move the controller to pan.

Another new feature lets you Track any object. If you are currently in the Chase view behind your plane and you choose the Track mode, you'll view a selected target object from the perspective of your plane, almost as if you were looking out the cockpit window and watching it go by.

The main sections of the SWOTL Film Viewing Room are the Film Controls, the View Modes, the Position Controls, and the Information Displays.

Film Controls

The Film Controls are Play, Advance, Rewind, Disk, and Exit.

- Press **Play** (P) to start and stop the recording. To see a few frames at a time, press Play repeatedly.

- Press **Advance** (A) to move rapidly forward in the film clip. Press again to stop advancing.
- Press **Rewind** (R) to return to the beginning of the tape.
- Press **Disk** (D) to open the disk access menu. This menu lets you load and save a clip, delete an unwanted file, or set your disk cache. The disk cache allows you to save longer film clips by saving out sections to disk periodically during the flight.
- Press **Exit** (E) to leave the Film Viewing Room. If you were in the middle of a mission when you viewed the film, you'll return to the action. If you had just finished a mission and were viewing the film, you'll go to the Mission Summary. If you started from the Main Menu, you'll return there.

View Modes

There are three view modes—Chase, Free, and Track.

- In the **Chase** (C) mode, you see the selected object from a position just behind it. The camera will follow whatever object you select.
- In the **Free** (F) mode, the camera remains in a fixed position. You can then zoom and pan using your controller to obtain the view you prefer.
- In the **Track** (T) mode, the camera will move to keep an object in view. If both Chase and Track modes are activated, the camera will view the objected tracked from the position of the object in Chase mode.

Position Controls

Use the Position Controls to select the targets for Chase and Free modes, and separate controls for Track mode. On the left are the controls for the Chase and Free selections; on the right are the Track selection controls.

Chase And Free Mode Position Controls

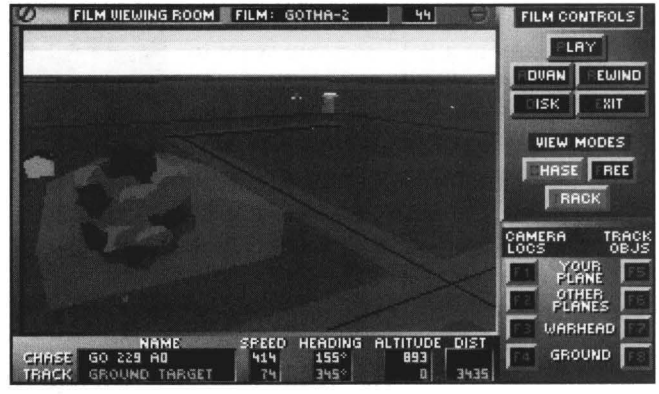
- Press F1 to select Your Plane and watch from outside your aircraft. If you are in Free mode and you press F1, the camera will switch to your current position, then remain there.
- Press F2 to toggle between all the other flying objects (except rockets and bombs). This includes all planes, but not parachutes. In Free mode, the view switches to the position of the selected object, then remains there.
- Press F3 to view from the perspective of a bomb or rocket in flight. In Chase mode, you'll follow the bomb or rocket until it explodes. In Free mode, the camera will remain in one position while the bomb or rocket continues on its trajectory.
- Press F4 to view the Ground Target. In Chase mode, you'll see it from above. If the target is being bombed or strafed, you'll see any hits that register. See Viewing the Film below

for a way to view from the Ground Target perspective.

Track Mode Position Controls

- Press F5 to Track your plane. A good way to use this setting is to select an enemy plane in Chase mode, then Track your plane and watch your approach and attack from the target's perspective.
- Press F6 to Track other planes.
- Press F7 to Track any rockets or bombs.
- Press F8 to Track the ground. One way to use this is to Chase a plane that is approaching on a bombing or strafing run, then Track the ground target. You'll see the ground from the perspective of the attacking plane, with a good view of the results of the attack.

Chasing your plane while Tracking the ground.



Information Displays

At the top of the screen you'll see the current action being displayed. If you've loaded a film clip from disk, the name of that clip displays at the top of the screen. To the right is a number that represents how much film remains. This number will slowly decrease as you play the film.

At the bottom of the screen you'll see the flight and position information for any currently selected objects. The top line shows the selected Chase object. For instance, if you have chosen to view your plane in Chase mode, you'll see the name of your plane, its Speed, Heading, and Altitude on the top line. On the second line, you'll see the same data for any object selected in Track mode. In addition, if there are both a primary and a tracked object, then you'll see the distance between the two.

Viewing the Film

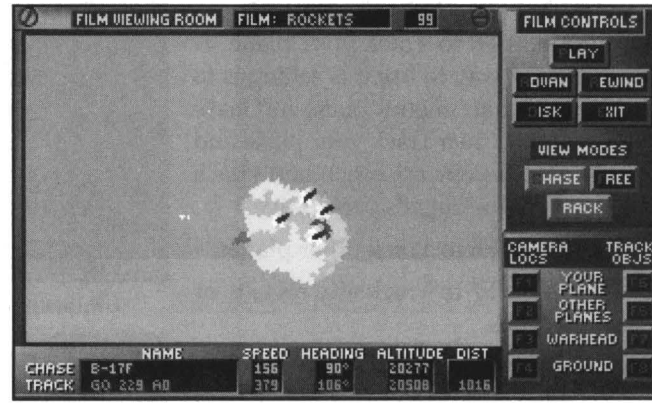
There are several ways to view your exploits, and each offers different insights. You can learn a lot about your own flying performance as well as the tactics of your enemies.

- Because you can use a joystick or mouse to control the camera view, perhaps the most artistic way to view your film is to use the Free mode and control the camera shots using pan and zoom. For instance, identify your plane (press F1 if necessary), then follow it through the action, zooming in for tight shots, and then zooming out to catch the action around you. You almost feel

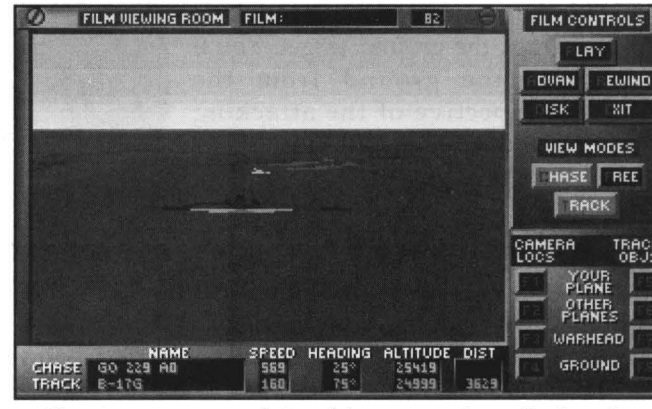
like the director of a film as you select just the right shot and angle. Don't worry if you suddenly lose sight of your plane. Simply press F1 again to relocate it. If the plane doesn't show up when you press F1, then you are zoomed in too tight. Zoom out and then press F1 again.

- Some of the most dramatic effects are obtained by using a combination of Chase and Track modes from different perspectives. For instance, if you are viewing your plane in Chase mode, you might use Track to select an enemy plane. Then watch the enemy from the perspective of your own plane.

  Or suppose you fire a rocket at a B-17 and you want to watch what happens from the bomber's perspective. First, wait until the rocket is fired, then pause the film by pressing Play again. Select the B-17 in Chase mode, then select your rocket in Track mode. You should see the rocket coming right at you. Or Chase a nearby plane to get a ringside seat. The same technique can be used to watch a bomb fall from the perspective of the ground target.

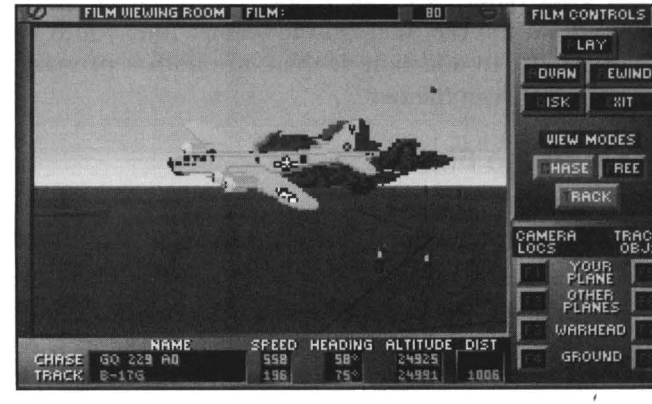


Above: Tracking a rocket.



Chasing a B-17 and Tracking your plane (2 shots).

- Another interesting perspective can be obtained by Chasing the Ground Target and Tracking your plane. By doing this, you'll see the action as if you were an observer on the ground. You may get some excitement if the B-17s drop their loads over you, as well. Often, however, the action is very far away. You may not see much if it is, but when the action is right overhead, the view can be spectacular.



Appendix B
Mission Builders

INTRODUCTION

As with any simulation, there comes a time when you've played every mission a hundred times and can fly them with your eyes closed. This is about the time when the game ends up on the shelf gathering dust. Fortunately, both BOB and SWOTL provide the tools to keep the products from ending up in the software graveyard.

The Mission Builder allows you to create your own missions, scenarios of your own devising. You can create missions that provide a maximum challenge, or create a mission that's easy enough for training a new pilot. You might even want to create strategically difficult missions and then pass them around and see if anyone else can beat them. Some commercial services like GENIE, support special interest groups for the Lucasfilm Games products where your missions can be shared with everyone across the country. The Mission Builder can open up whole new dimensions in these games.

Though planning and creating missions can take some time, the effort is definitely worthwhile. Since the mission builders for BOB and SWOTL are different, we'll walk you through the creation of a mission, step-by-step, a unique mission for each product. After you have completed the creation process, feel free to fly the mission(s) and make modifications as you see fit.

The missions created in this chapter are geared for the intermediate player. Advanced players may not find them challenging enough. However, at the end of the chapter you'll find some tips on how to make the missions more challenging. Advanced players should follow the steps for the creation of each mission, then skip to the tip section at the end before actually flying the custom missions.

HOW TO BECOME A MISSION BUILDING GOD. . .

The first step in creating a mission with either BOB or SWOTL is planning. By planning a mission on a piece of paper, you can save yourself a lot of time and frustration. When planning a mission, here are some questions you should ask yourself.

1. *How difficult do I want to make this mission?*
2. *What do I want to accomplish in this mission? Do I want to shoot down a lot of planes? Do I want to bomb something? Do I want to protect something?*

3. *Where do I want to start the mission?*
4. *What is the target? (Refer back to question 2)*
5. *How complicated should the mission be?*
6. *What types of aircraft will be involved?*

After you've completed your planning, the next step is to refer to the maps included with each product and start the design phase. In the design phase, you should create a checklist similar to the following chart.

Mission Checklist

1. The starting location for each side will be:

Allies (British) _____ **Altitude** _____

German _____ **Altitude** _____

2. The other aircraft locations will be:

Group 1 _____ **Altitude** _____

Group 2 _____ **Altitude** _____ **Etc.**

3. The targets will be:

Group 1 1_____ 2_____ 3_____

Group 2 1_____ 2_____ 3_____ **Etc.**

4. The aircraft will fly to (way points):

Group 1 1_____ 2_____ 3_____

Group 2 1_____ 2_____ 3_____ **Etc.**

5. The orders for each aircraft will be:

Group 1 _____

Group 2 _____ **Etc.**

6. The aircraft will land at:

Group 1 _____

Group 2 _____ **Etc.**

After you've completed your planning, the next step will be to start the Mission Builder and begin the implementation phase. In this step, you begin entering all of the information you've gathered in the first two steps and make modifications as necessary.

The final step is testing. After you've completed the implementation phase, you'll want to test your mission to see how it performs. You can return to the Mission Builder and make changes if you're not satisified.

CREATING A MISSION WITH BOB

In this section, you'll learn how to create a mission with the BOB Mission Builder. This example will introduce you to the basic features of the Mission Builder simultaneously demonstrating how proper planning can make building a mission a whole lot easier!

Step 1: Planning

The mission you'll be creating will be moderately difficult. The scenario will feature two waves of Stuka dive bombers attacking the Hawkinge 11 Group Satel. Airfield as a primary target, and a secondary target at Lympne 11 Group Satel. Airfield. The Stukas will have a minimal amount of fighter coverage. The British will have Hurricanes as fighter defenses. At the start of the mission, the British will start over the target areas while the Germans will start over the Channel near the targets.

The fighter escort for the Germans will lead the dive bombers and engage the British fighters first. The player will fly in the flight group over the primary target and will act as the flight leader.

Step 2: Design

The British will have two groups of planes. The first group, which is the group the player will lead, will start at an altitude of 10,000 feet over the primary target at Hawkinge 11 Group Satel. Airfield in a Vic formation. It will be composed of two Hurricane MK Is. The pilots flying in this group will have officer experience. The orders for this group will be to attack the bombers. This group will land at the target airfield upon completion of the mission. The second group will be composed of two Hurricane MK Is flying over the secondary target at Lympne 11 Group Satel. Airfield at an altitude of 10,000 feet in a Vic formation. The pilots flying in this group will have officer experience. The orders for this group will be to attack the bombers. This group will land at the secondary target airfield upon completion of the mission.

The Germans will have four groups of aircraft. The first group will consist of two Bf 109s escorting the second group of three Ju 87 Stuka dive bombers at 10,000 feet. The mission will begin with both groups just off the English coast. The two groups will fly to the primary target, continue on to the secondary target and then head for home at Wissant Luftwaffe 2 Airfield JG 51. The third and fourth groups will be identical to the first and second groups, respectively. They will start the mission slightly more than mid-Channel, behind the first and second group, and follow the same flight path and land at the same airfield.

Step 3: Implementation

In this phase you'll use the Mission Builder to enter the details of the mission. The following steps will show you how to do this.

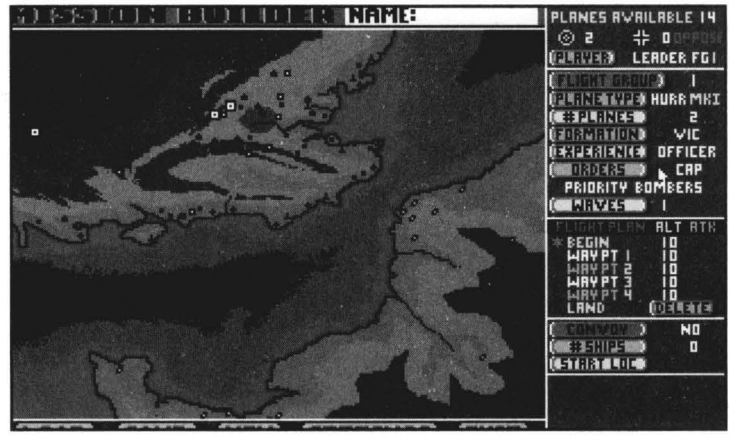


Figure 1: Initial Settings for Flight Group 1.

- Start the BOB mission builder from DOS by typing *MB* and hit **<Enter>** or **<Return>.**
- Move your controller until the white arrow is over the PLANE TYPE button. Click until the plane type to the right of this button reads **HURR MKI**.
- Move your controller until the white arrow is over the #PLANES button. Click until the number of planes to the right of this button reads **2.**
- Now move your controller until the white arrow is over the EXPERIENCE button. Click until the experience type to the right of the button reads **OFFICER**.
- Ensure the rest of the settings haven't been changed by accident. Refer to Figure 1.

Next, you'll need to enter the starting and ending locations for this group.

- Look at the section titled FLIGHT PLAN ALT ATK. Make sure the asterisk at the very left of this section is next to BEGIN. If it's not, move the white arrow over BEGIN and click once to move the asterisk to that selection.
- Move the white arrow over the map until you see Hawkinge 11 Group Satel. Airfield appear in the lower right dialog box. If you're not sure where this is on the map, look at the narrowest point in the channel between England and France. Both airfields are just south of this point on the English side. Now click once to set the BEGIN portion for this flight group. You should see a **B** over the airfield.
- Once you click the button you'll notice that the number under ALT across from BEGIN has been set to 0. Move the white arrow back to the FLIGHT PLAN ALT ATK section, over the 0. Click until the number reads **10**. This is your starting altitude in thousands of feet.
- Now move the white arrow over the LAND option in the FLIGHT ALT ATK section. Click once to move the asterisk next to it.
- Move the arrow back to the map and position it again over the Hawkinge 11 Group Satel. Airfield. Click and an **L** should appear over the airfield.

At this point, your screen should look like Figure 2.

Now fill in the rest of the information for this mission by using the chart called "Setup Chart for Mission Killhawk." Place the German aircraft perhaps 1/4 inch to the right of the Hawkinge 11 Group Satel. Airfield (see Figure 3).

Note that, under the heading "Orders," escort missions are designated as the type of escort, and the group to be escorted in parentheses. For instance, flight group 3 is performing Close Escort-Level for group 4.

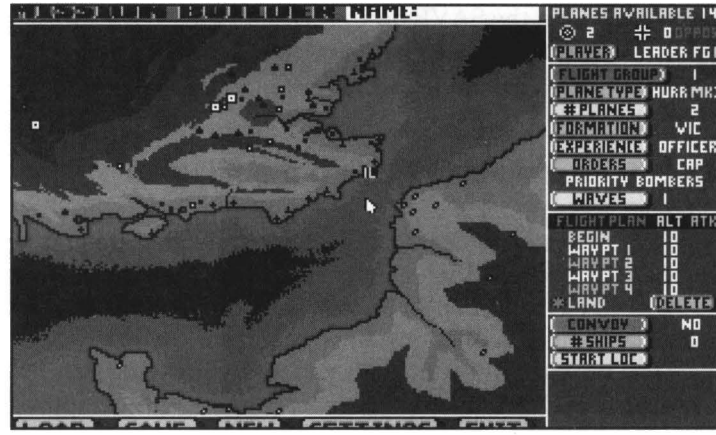


Figure 2: Final Settings for Flight Group 1.

Setup Chart for Mission "KILLHAWK"

Grp.	Plane	#	For	Exp.	Orders	Alt	Begin	Way 1	Way 2	Land
No.1	Hurr	2	VIC	Ofc.	CAP	10	Hawkinge	***	***	Hawkinge
No. 2	Hurr	2	VIC	Ofc.	CAP	10	Lympne	***	***	Lympne
No. 3	Bf109-3	2	VIC	TOP	Esc-Lvl (4)	10	Channel	Hawkinge	Lympne	Wissant
No. 4	Ju87B-2	3	Swm	TOP	Dive Bomb	10	Channel	Hawkinge	Lympne	Wissant
No. 5	Bf109-3	2	VIC	TOP	Esc-Lvl (6)	10	Channel	Hawkinge	Lympne	Wissant
No. 6	Ju87B-2	3	Swm	TOP	Dive Bomb	10	Channel	Hawkinge	Lympne	Wissant

- When you've finished entering the information, it's time to save your mission. Move the white arrow to the top of the screen, to the white box titled NAME:. Click on the box and type *KILLHAWK*, or any mission name you prefer, and hit **<Enter>** or **<Return>.** Move the white arrow to the bottom of the screen and

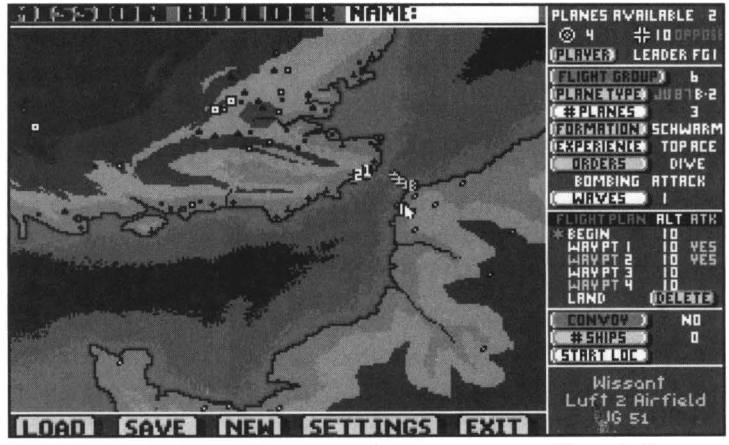


Figure 3: Final Settings for mission "Killhawk."

click on the SAVE button. When you see the message "Mission saved" at the lower right box, your mission has been saved to disk.

- Finally click on the EXIT button to leave the Mission Builder.

Step 4: Testing and Playing the Mission

The final step is testing and playing the mission you've just created. Start BOB from DOS if you haven't already done so, and select Fly Custom Mission.

Then select KILLHAWK (or whatever filename you used to save your mission) from the list of available custom missions on your screen.

The mission will start with you and your wingman flying at 10,000 feet over the Hawkinge Group 11 Satel. Airfield. The enemy aircraft will be approaching at the same altitude from the east. The first group of Bf 109s will engage you first, followed by a group of Stukas, another group of Bf 109s, and finally the last group of Stukas. Take notice that the second group of Hurricanes is also approaching the group of enemy planes from the Lympne Airfield to the south. If for any reason the mission is not playing this way, return to the Mission Builder and re-check all of the flight group settings and starting positions, then make adjustments as necessary.

How to Make this Custom Mission More Difficult

If you find this mission is too easy for you can try the following changes to increase the difficulty.

- Start your two groups of Hurricanes on the ground at their respective airfields. Do this by changing the BEGIN altitude for flight groups 1 and 2 to 0.
- Set the experience level of the two Hurricane groups to NOVICE.
- Change the starting locations of the Stukas and Bf 109s so that groups approach the airfields from different directions and distances.
- Add more Stukas to the German side.

Any one or combination of these changes will tip the balance in favor of the Germans.

CREATING A MISSION WITH SWOTL

In this section, you'll learn how to create a custom mission with the SWOTL mission builder. The steps below will introduce you to the basic features of the mission builder. Creating custom missions is very convenient in SWOTL since the tool is built directly into the main program.

Step 1: Planning

The mission you'll be creating will be moderately difficult. The scenario will start with a group of FW 190s, which you will lead, patroling near the Duisburg Oil Refinery looking for enemy bombers. The historical period will be from August to December, 1943. The FW 190s will

encounter a group of B-17 bombers, protected by P-47s, heading for the oil refinery. The FW 190s will engage the enemy in an attempt to stop the bombing raid against the oil refinery.

Figure 4: Initial Settings for mission "190ATK."

Step 2: Design

The FW 190s will start their patrol at 20,000 feet, half way between the Duisburg Oil Refinery and their home field at Woensdrecht Luftwaffe Airfield. There will be four FW 190s in the patrol. The pilots will have VETERAN experience. The orders for this group will be to attack the bombers. After the mission, the group will land at their home field at the Woensdrecht Luftwaffe Airfield.

The enemy group will be composed of four B-17s and three P-47s. The group will start their mission slightly west of the starting position of the FW 190s, also at 20,000 feet. The pilots will also have VETERAN experience. Their orders are to bomb the Duisburg Oil Refinery. The P-47s will fly top cover for the bombers. After the mission, the enemy group will land at their home fields, Thorpe Abbotts American Airfield and Leiston American Airfield.

Step 3: Implementation

- If you haven't already done so, load SWOTL from DOS and select the German side. Next select CUSTOM MISSIONS from the main menu.
- Select CREATE CUSTOM MISSION from the CUSTOM MISSION MENU.
- Select AUG-DEC 1943 from the SELECT HISTORICAL PERIOD MENU.
- Move the yellow arrow over the map until it's pointing to Woensdrecht Luftwaffe Airfield. Click once, and an information box appears with information about this airfield.
- Click on the CREATE FLIGHT GROUP button. Three more boxes appear at the bottom of the screen.
- Now click on the # OF PLANES button in the FLIGHT GROUP box until it reaches 4.

Now move the cursor to the box titled FLT PLAN ETA ALT ATK and click on BEGIN.

- Move the yellow arrow back over the map. Notice that the arrow changes to a crosshair. Move the crosshair so that it is approximately half way between the Woensdrecht Luftwaffe Airfield and the Duisburg Oil Refinery, then click the button. Notice that a B has moved from the Woensdrecht Airfield to this new location. Refer to Figure 4.
- Move the yellow crosshair back to the FLT PLAN ETA ALT ATK box , position it over WAY PT 1, and click on this selection.

- Back on the map, click just to the left of the B. A **1** should now appear on the map. See Figure 5.
- Move the yellow crosshair back to the FLT PLAN ETA ALT ATK box and click the DONE button. The crosshair now changes back to an arrow.
- Move to the adjacent box to the left and click on NEXT FLIGHT GROUP.
- Back on the map, click on Thorpe Abbotts American Airfield. Notice that a box appears with information about this airfield. Click on the CREATE FLIGHT GROUP button.
- Click on # OF PLANES until the number to the right read **4**.
- Click on SHOW ALL FLIGHT PLANS to see the Luftwaffe flight plan you just created.
- Move the yellow arrow to the FLT PLAN ETA ALT ATK box and click on BEGIN.

Figure 5: Final Settings for the first flight group.

Figure 6: Final settings for the second flight group.

- Move the crosshair over the map until it is over the 1 of the Luftwaffe flight plan and click on it. A **B** should now appear over the 1.
- Now click on WAY PT 1.
- Move the crosshair back to the map, position it over the Duisburg Oil Refinery and click. A **1** should appear over the target and a YES should appear under the ATK column for WAY PT 1.
- Click the DONE button.

Your screen should now look like Figure 6.

- Now click on NEXT FLIGHT GROUP.

- Position the arrow over the Leiston American Airfield, then click.
- Click the CREATE FLIGHT GROUP option in the information box that appears.
- Click on the # OF PLANES: selection until it reaches **3**.
- Click on BEGIN.
- Move the crosshair over the map until it's over the red B and click. A new **B** appears at this location.
- Move the yellow crosshair back to the FLT PLAN ETA ALT ATK and click on WAY PT 1.
- Move back onto the map and position the cursor over the red 1 at the target, then click. A new **1** now appears on the map.

Your screen should now look like Figure 7.

Figure 7: Final Settings for mission "190ATK."

- Move the yellow crosshair back to the FLT PLAN ETA ALT ATK menu and click on DONE.
- Now click EXIT in the selection box.
- Finally click the SAVE button. SWOTL now asks for a filename. Type in *190ATK*, or any filename you wish, and hit **<Enter>** or **<Return>.** Your mission is now saved to disk.
- Click on EXIT to leave the Mission Builder.

Setup Chart for Mission "190ATK"

Grp.	Plane	#	For	Exp.	Orders	Alt	Begin	Way 1	Land
No.1	FW190	4	Schwarm	Vet.	Int. B-17s	20	Duisburg	W of Duisburg	Woensdrecht
No. 2	P-47	3	Finger 4	Vet.	Esc-Top	20	W of Duisburg	Duisburg	Leiston
No. 3	B-17	4	Box	Vet.	Lvl. Bomb	20	W of Duisburg	Duisburg	Thorpe Abbotts

Step 4: Testing and Playing Your Mission

If you're not already in the CUSTOM MISSION MENU, select it from the main menu now.

- Select FLY CUSTOM MISSION and a menu appears with the available custom missions to fly. Select 190ATK (or the filename you used to save your custom mission) and click on the FLY button.

- Select START to fly the mission.

You'll start the mission flying west. The enemy planes should appear directly in front of you after a few moments at the same altitude. Since you are the flight leader, the other FW 190s should be at the side and slightly behind you. If they're not, then you may need to re-check your settings in the Mission Builder. Count the number of your planes and the enemy planes and make sure they match what you entered. Also make sure the planes are of the right type!

How to Make this Custom Mission More Difficult

- If you find the mission too easy, here are some suggestions to make it more difficult:
- Start the your flight group on the ground and make them climb to intercept the bombers.
- Use fewer planes in your flight group or increase the number of enemy bombers or fighters.
- Change the experience level of the enemy to TOP ACE.

Appendix C
Aerobatics

FLIGHT INSTRUMENTS

You can tell a lot by looking out your windows, but it's important to learn how your instruments work. The following flight instruments are used as inside references for flight control:

Attitude Indicator: Shows pitch and bank

Heading Indicator: Shows direction of flight

Altimeter: Shows altitude

Vertical Speed or Rate of Climb Indicator: Shows rate of climb or descent

Airspeed Indicator: Shows the result of power or pitch changes through changes in the airspeed.

It is important that you learn to use your controls to attain proper attitude in relation to the horizon and to check your inside and outside references in a systematic way. Otherwise flying an aircraft can become a confusing and terrifying thing.

The In-flight Scan

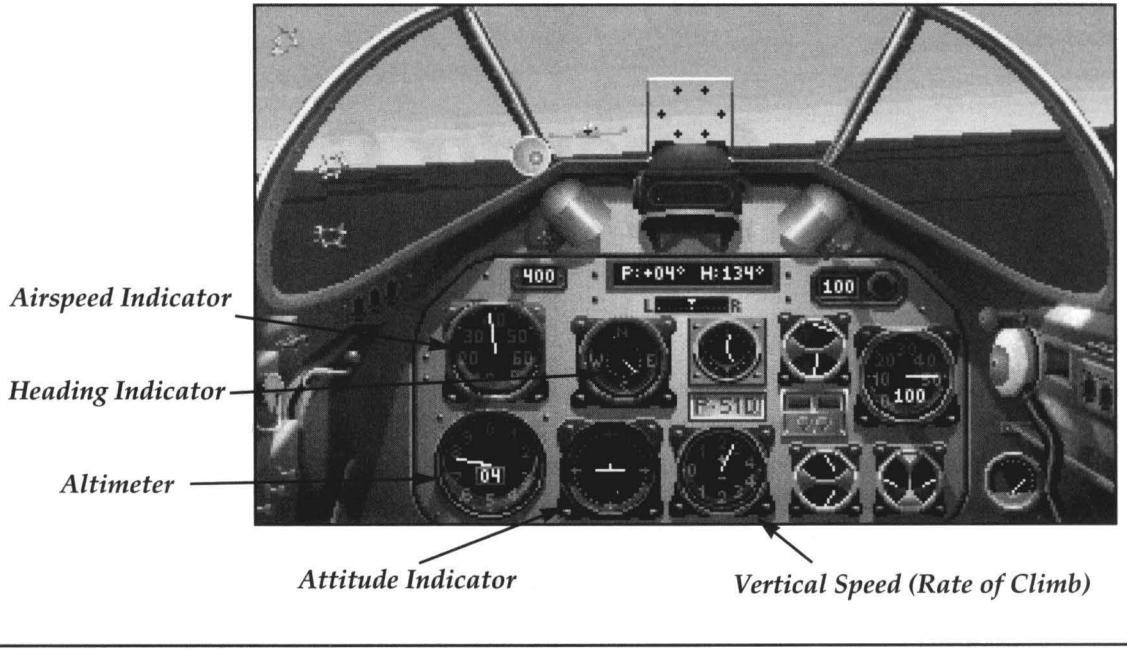
With all the flight instruments and visual cues available during flying, it's a good idea to develop a systematic approach to scanning your instruments and the visual out-of-cockpit information. This insures that all of the important items are being looked at, at least once in a while.

Though you might develop a better scan on your own, try this scan as a starting point:

1. Look out the right window, then back to the front window.
2. Look out the left window, then back to the front window.
3. Look out the rear window, if available, then back to the front window.
4. Scan your six primary instruments to view the airspeed, altitude, and heading, then look out the front window.

The visual scan out the windows lets you look for other aircraft—something that is very important in preventing enemy aircraft from jumping you by surprise.

Occasionally, every minute or so, when you perform Step 4, also look at the engine gauges (RPM, Fuel, etc.)



SIMPLE AEROBATICS

We'll assume that you know how to fly straight and level and how to take off and land. If not, you're on your own. But here are some aerobatic maneuvers you can try.

Before you start, check out what the U.S. Air Force jet pilot training manuals say:

> "Good acrobatics do not involve 'slamming the aircraft around.' Smoothness and precision are most desirable... Before starting acrobatic maneuvers, tighten safety belt and check cockpit for loose items."

The Spin

The spin is the the simplest aerobatic maneuver to perform and just about any aircraft is capable of doing it. A spin is basically a stall where one wing stalls before the other. This causes one wing to drop and puts the plane into a corkscrew descent. The plane remains in the spin until the pilot moves the controls to stop it.

Making a Spin

1) In cruising flight bring the throttle back to idle.
2) Use the elevators to raise the nose slowly to a point slightly above the horizon. Hold this attitude until you get the stall warning message. Apply additional up elevator and full rudder, left or right to spin left or right respectively.
3) The plane will roll to a 90 degree bank and beyond as the spin develops.

Recovering from a Spin

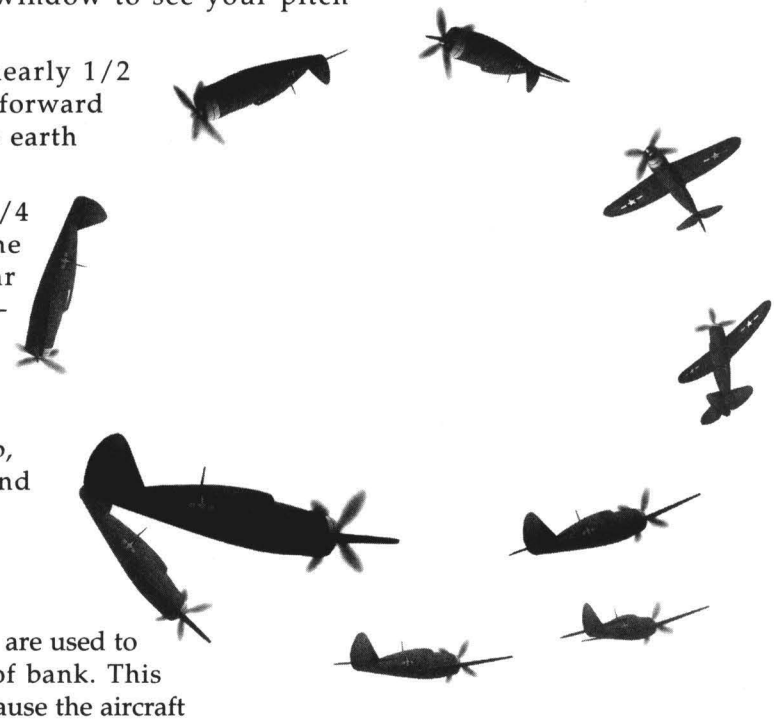
1) Recover from the spin by using full opposite rudder to stop the rotation.
2) Apply down elevator to reduce the angle of attack.
3) Complete the recovery by applying up elevator to raise the nose to the horizon. Be careful not to raise the nose too quickly otherwise, you may stall again.
4) Apply cruise power.

The Loop

This is the second easiest aerobatic maneuver. You use the elevators and throttle to pitch the plane through a vertical 360 degree circle in the sky. The key to a successful loop is to have enough airspeed to allow the aircraft to fly through the complete circle without stalling.

Making a Loop

1) Get into normal cruise flight.
2) Use down elevator to dive rapidly until the airspeed reaches 200 knots.
3) Apply up elevator smoothly until it reaches about 3/4 up.
4) After the nose rises and you see blue sky through the windshield, apply full throttle. Look out the side window to see your pitch orientation.
5) When the loop is nearly 1/2 complete switch to forward view and watch the earth appear upside down.
6) When the loop is 3/4 complete bring the throttle back to near idle to avoid over-revving your engine.



Recovery from a Loop

As you come out of the loop, level off, apply power, and resume normal cruise flight.

Aileron Rolls

In this maneuver, the ailerons are used to roll the plane 360 degrees of bank. This maneuver is fairly simple because the aircraft

in the simulations are very capable of rapid roll rates. The difficult part is to come out of an aileron roll at the proper time.

Making an Aileron Roll

1) Start a shallow dive to pick up the airspeed about 30 knots over cruise speed.
2) Use the elevators to raise the nose to a point slightly above the horizon (about 20 degrees).
3) Neutralize the elevators and smoothly apply left or right aileron, depending on which way you want to roll; left or right. If you are in Advanced Mode, you may want to apply slight rudder pressure as well.
4) The plane will roll past vertical (90 degree bank), upside down (180 degree bank), vertical (270 degrees), and then roll toward level.

Recovering from an Aileron Roll

1) In the last quarter turn, begin to relax on the stick until you return to level flight.
2) If you properly time it, you will be near level attitude when the roll stops.

COMPLEX AEROBATICS

Inverted Flight

Inverted, or upside down, flight can be quite confusing. This maneuver is an extension of the aileron roll, but you must neutralize your ailerons as the plane rolls past vertical to stop the roll as the plane turns upside down.

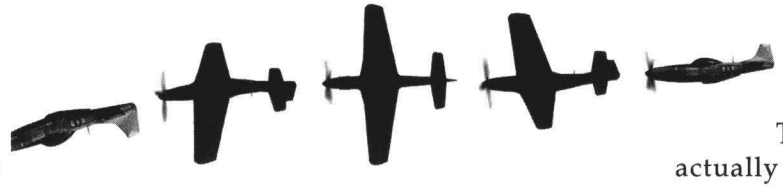
At this point the horizon will be upside down. The elevators work backwards. Pushing forward drops the nose toward the sky! The ailerons work as usual. If you start losing altitude while you're upside down, remember to push the nose down (down elevator).
Complete inverted flight by completing the last half of the aileron roll.

Flying Inverted

1) Begin an aileron roll.
2) Begin neutralizing your aileron shortly after rolling past 90 degrees and stop the roll so the plane is upside down.
3) Use reverse elevator to control pitch and establish level inverted flight.

Recovering from Inverted Flight

Apply aileron to complete the last half of the aileron roll.



Split S

This maneuver is actually another way of coming out of inverted flight. Instead of completing the aileron roll, you pull back on the elevators, cut the throttle, and do the last half of a loop.

Flying a Split S

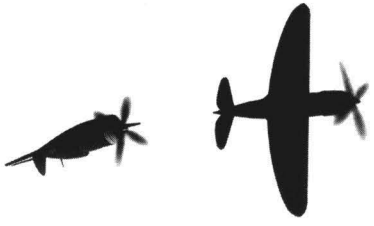
1) Begin an aileron roll.

2) Begin neutralizing your ailerons shortly after rolling past 90 degrees to stop the roll so the plane is upside down.

3) Once in inverted flight, apply up elevator and close the throttle to do the last half of a loop.

Recovering from a Split S

As you come out of the loop, level off, apply throttle, and resume cruise flight. In a properly executed Split S, you may lose as much as 4,000 feet of altitude.



Immelman

This maneuver was named after the German Ace, Max Immelman, and is used to evade other aircraft in a dogfight. The Immelman is a half loop followed with a half roll (as opposed to a Split S which is a half roll followed by a half loop).

Flying an Immelman

1) Position the plane as described in the Loop.

2) Note your heading and begin the loop.

3) Neutralize your elevators the moment the plane becomes exactly inverted at the top of the loop. This stops the plane in inverted flight at a relatively slow airspeed.

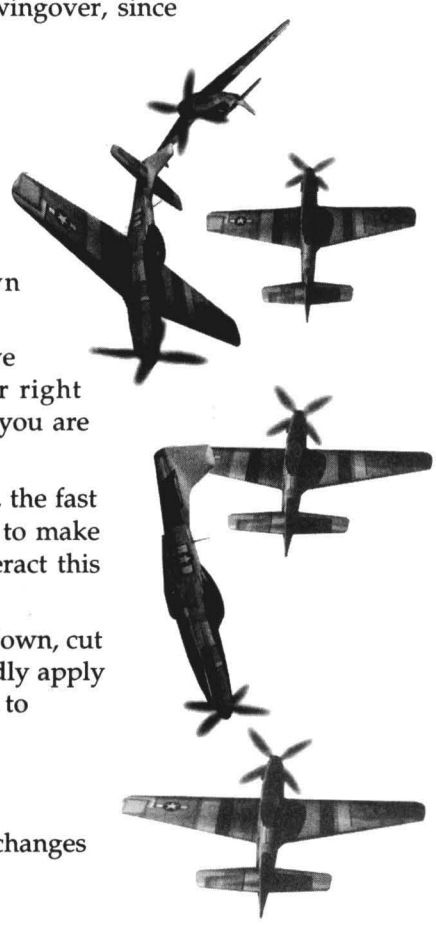
4) Follow through with a half roll and level off.

Recovering from an Immelman

Fly straight and level to cruise speed.

Hammerhead

The Hammerhead turn or stall is often referred to as a wingover, since that describes what the plane does.



Flying a Hammerhead (Advanced Mode only)

1) Apply 3/4 up elevator and full throttle for vertical climb.
2) Look out the side window. Just as the bottom of the wing comes up perpendicular to the horizon, neutralize the elevators or apply slight down elevator. You are now in vertical climb.
3) When the airspeed drops to about 80 knots, leave the elevators unchanged and apply full left or right rudder, looking out the window in the direction you are applying the rudder.
4) As the plane yaws at the top of the Hammerhead, the fast moving outer wing develops more lift and tends to make you roll. Carefully use opposite aileron to counteract this roll. This takes a lot of practice!
5) Once the nose has yawed 180 degrees to straight down, cut power and neutralize all flight controls, then rapidly apply up elevator to recover from the vertical dive back to level flight.

Recovering from a Hammerhead

1) Turn to a proper heading, because this maneuver changes your heading by 180 degrees.
2) Resume cruise flight.

OTHER MANEUVERS

There are other flight maneuvers you can try. Here are some brief descriptions.

Low Yo-Yo

A Low Yo-Yo lets you gain on a plane with superior speed. Simply initiate a shallow dive, flying below your target. When you think you can get into shooting range, climb up from underneath

him; you'll be in his blind spot. If your opponent senses what you're doing, however, all he has to do is use his superior speed to climb, and he'll lose you.

High Yo-Yo

If you have a considerable speed advantage over your target, you may want to try a High Yo-Yo to bleed off some of the excess power. Simply initiate a climb, then, when you're in position, dive down on your opponent. This is also a good maneuver to counter an opponent who is executing a Barrel Roll to throw you off.

There are other, more complex maneuvers you can perform—the banked versions of the High and Low Yo-Yo, for instance, or the Spiral Dive—but these should give you a good start.

FIGHTER TACTICS—SOME RULES FOR ENGAGEMENT... AND SURVIVAL

Speed and Surprise

The two most important words of survival for a fighter pilot of the World War II era were height and sun. Height, or altitude, means speed. If you are higher than your opponent, you can dive on him, attaining much greater speeds than your (or he) can in normal flight. This gives you the ability to close quickly and shoot him down, but it also gives you the ability to escape at high velocity if things don't go quite according to plan or if your victim has friends in the area.

The advantage of the sun is obvious. You use it to come in on your opponent where he can't see you. Although the sun is represented as a yellow circle in the Lucasfilm flight simulators, remember that, in the real world, it is a blazing, blinding orb, and that anything coming at you with the sun behind it is going to be invisible to you.

A Spiral Dive

Both height and sun contribute to the element of surprise. If you're going up against another fighter, surprise is your best ally. Another way to put it is "See him first; don't let him see you." Many of the most successful aces shot down their enemies before they even knew they had company. Part of the trick is to keep checking all around the combat area—wherever you can look. Since the planes you'll fly in the Lucasfilm simulators don't have inboard radar, you need to use your eyes, or use the ground control (Inflight Map) to locate your opponents before they locate you.

Of course, the element of surprise only works in some instances. It is pretty hard to surprise a bomber; it has many eyes. And it's hard to surprise a fighter attacking your airfield, where he has the advantage. But in any given moment, the fighter pilot who gains the advantage of height and/or sun may surprise an unwary or otherwise occupied enemy.

MALAN'S RULES

"Sailor" Malan was one of the great fighter aces of the Battle of Britain. His rules were printed and distributed all over, and they are still meaningful today.

Ten of My Rules for Air Fighting

1. **Wait until you see the whites of his eyes.**

   Fire short bursts of 1 to 2 seconds and only when your sights are definitely 'ON.'
2. **Whilst shooting think of nothing else, brace the whole of the body, have both hands on the stick, concentrate on your ring sight.**
3. **Always keep a sharp lookout. "Keep your finger out!"***
4. **Height gives you the initiative.**
5. **Always turn and face the attack.**
6. **Make your decisions promptly. It is better to act quickly even though your tactics are not the best.**
7. **Never fly straight and level for more than 30 seconds in the combat area.**
8. **When diving to attack always leave a proportion of your formation above to act as top guard.**
9. **INITIATIVE, AGGRESSION, AIR DISCIPLINE, and TEAM WORK are words that MEAN something in Air Fighting.**
10. **Go in quickly — Punch hard — Get out!**

* Chuck Yeager calls this "keeping my head on a swivel."

Good Shooting—Using the Guns

Once you've found an enemy target, you've got to try to make your shots count. When going up against another forward-firing fighter, the ideal situation is to climb up his tail and let him have it from point-blank range. But often you'll have to take shots while maneuvering. If you get to know your guns and your own skills, you'll be able to hit your enemies from just about any position—climbing, diving, turning, or inverted.

There are several important factors to consider when you decide to shoot down another plane.

- Knowing the range of your guns is very important. You can't afford to waste shots by trying to hit something that's just a speck in the distance. Practice with the plane of your choice until you know about how close you need to be before you hit anything.

  Knowing your range can be especially useful if you're going up against a bomber and you happen to have weapons that can hit the bomber from outside the effective range of the return fire. If you can achieve this sort of superiority and take advantage of it, you'll be able to pick off the enemy without taking unnecessary hits.

  Also remember that your effective range is the distance from which you can actually hit something, not necessarily the distance your ammo travels when fired. This effective range is influenced by distance and by your angle of attack.

- If you're directly behind an enemy plane, but at a great distance, remember that your bullets will fall somewhat due to the effect of gravity. This is called the holdover angle. You'll have to compensate for the holdover angle if you expect to hit anything from extreme range. At close range, the effect is negligible.

- On the other hand, when you're in a turn the bullets will fly straight. Therefore, they'll tend to fall behind the target. To hit a target when you're in a turn requires that you learn to use deflection shooting—the art of leading an enemy so that your bullets shoot out in front of his path and he flies into them!

  The deflection angle is the angle of his flight path to yours. For instance, a plane flying directly away from you has a deflection angle of 0 degrees. If he's flying perpendicular to you (straight across your nose), his deflection angle is 90 degrees. It's hard (but not impossible) to hit an enemy plane flying at a deflection of 90 degrees.

- When leading a plane, remember that both the deflection angle and the turn radius affect where the bullets will end up relative to your target. The higher the deflection angle, the more you'll need to lead your enemy. Likewise, the tighter the turn, the more you'll need to lead him.

- Fire in short bursts. Unless you're really sure you've got him, you can watch the tracers and make adjustments in your flight path or gun angle to correct your aim.

- If you think you're close enough. . . get closer! If you can, fill the screen with enemy airplanes before letting loose with your guns. The closer you are, the better are your chances of ripping your enemy apart.

Appendix D
Their Finest Missions

SNEAKERS

Concentrate on the bombers in this mission. They are the objective. Keep a watchful eye on the map to determine the altitude of the attacking bombers. In this mission, you'll find that the bombers come in at different altitudes. Take one group out at one flight level and then move on to the next.

SPOILER

In this mission the bombers have a long way to the target, so take your time and make each shot count. Concentrate on the escort fighters first, then attack the bombers.

DODODOWN

Take off and follow your waypoints on the in-flight map to the target bombers. Watch your fuel consumption and ammo. Attack the bombers in a fast approach from the front.

PANIC!

Though some BOB enthusiasts have said this mission is impossible, it not! Pick off the Stukas in the lead first, before they begin their dive. Make sure you don't follow the lead group into the dive. Otherwise, you'll lose precious altitude. By making every shot count you'll succeed!

GOODHVNZ

Go for the lead planes first. You may have to engage some of the Bf 109s before you can get to the Bf 110s. After you've cleared enough of them away, then begin your assault on the Bf 110s.

BOUNCE!

In order to succeed in this mission, all of the Stukas must be eliminated. Make quick, devastating attacks against them. Watch the rear tail gunner. If you're approaching them from behind, make sure you're below them.

HURRI-UP

The enemy aircraft in this mission are going for the convoy in the channel. Go for the lead aircraft and break up the formations. Time is critical in this mission. Make your attack runs quickly and accurately.

123PUNCH

Attack the lead aircraft first. Don't give up on one group and move on to the next without destroying all of them first. Frontal attacks from above work well in this mission against the bombers.

HEVYRAIN

This mission is marginally impossible so don't be discouraged if you don't do well. Stick with each group of bombers until the group is destroyed before moving on to the next group. Watch your damage and your ammo. Make every shot count.

SWEEP1

Your wingman in this mission is a novice, so you want to try and keep him alive if possible. Do lots of turns and altitude changes to keep the enemy fighters off your tail. Don't get fixated on one particular plane, leaving yourself open to getting nailed from behind.

JIM2

Conserve your ammo and concentrate on getting your JU 88 bombers to the target. There are lots of enemy fighters in this mission. It is possible that you may encounter up to 37 Hurricanes!

NITERAID

In this mission your Bf 109 is equipped with a single bomb. The other aircraft in your group will drop their bombs on the Dover Chain Home Low Radar Station. Save your bomb for the Hawkinge 11 Group Satel. airfield. Don't forget to strafe the fighters parked at the Hawkinge airfield. Expect to get bounced by enemy fighters on the way home, so conserve your ammo.

DAVYJONZ

Escort the Bf 110s to the target convoy in the channel. Get in front of them and engage the fighters before they can get to the Bf 110s.

AUDACITY

This is another fighter/bomber mission with the Bf 109. Dogfight the enemy fighters before moving in for your attack run against the target. After you drop your bomb, dogfight as many enemy fighters as you can before you head home. The enemy fighters in this mission will follow you home, if you don't take them all out over England.

LORDHAHA

Get in and out of the target area as quickly as possible. Don't dogfight the enemy fighters if possible. Use your tail gunner instead. The fighters will follow you home so you may have to turn and shoot at them if they get too close.

SUICIDE

Fly straight to the target and use your tail gunner whenever possible. Once you're over the target, expect more enemy fighters to show up. Concentrate on the bombing run rather than the fighters. Stay low on the way home to avoid attacks from below by the enemy fighters.

UCANDOIT

Engage the enemy fighters as they attack the Stukas taking off from their home field. Then protect the Stukas to and from the bomb targets. In this mission, you'll have to really watch your fuel as this is a long mission.

TOUGH2

This is primarily a Stuka dogfighting mission. Engage the enemy fighters first before moving in to dive bomb the target. In order to succeed in this mission, you'll have to split your shooting between your front and rear tail gunner. Otherwise, you'll run out of ammo quickly.

STUKAMAN

You'll have to split your shooting between the front and rear tail gunner position in this mission because you have no fighter escort to protect you. Before you can begin your bombing run, you must take care of the attacking fighters first.

DODOBIRD

The fighter escorts in this mission that are protecting you are not very good, so you'll have to protect yourself to and from the target. After you release your bombs, stay low to protect yourself from attacking enemy fighters on the return trip home.

ESPIONAJ

In this fantasy mission, you must land at the Tangmere airfield to pick up a spy. As you land, set your tail gunner on auto and roll down the runway. Your tail gunner will shoot the parked enemy fighters. Once you pass the hangars, take off to the east and dive bomb either secondary target. If you don't feel like landing in this mission you can make a low approach to the field and shoot the enemy aircraft on the ground yourself, though this takes away from the role-playing aspect of the mission.

CLEANUP

Flying in your HE 111, your mission is to hit any buildings that were not destroyed in the preceding wave of bombers. Enemy fighters will attack you throughout the mission. Use your bombs conservatively, and try and take out as many buildings as you can at each target site.

WHAM-BAM

This is a difficult dive bombing mission in a JU 88. When you get close to the target, turn your guns on auto and watch what your flight leader is doing. Dive bomb on a building that is not being attacked by your flight leader. Once you complete your bombing run, keep your altitude low to avoid enemy fighter attacks from underneath.

Appendix E
Tips from Larry Holland

On several occasions we spoke with Larry, and we thought you'd be interested in some of his comments about his games. The first section deals mostly with BOB and the last part deals mostly with SWOTL. The information is extracted from the interviews, so it does not follow any fixed format. Still, for players of Larry's games, this is some great information straight from the source!

- Medium bombers have the most straightforward AI. They follow their flight plan directly to the target without atttempting evasive maneuvers and drop their bombloads. When they get ready to bomb, they get stair-stepped, one behind the other, each picking out a different building. Dive bombers also each pick out a different building to attack.

- Each British target is composed of a group of buildings with each building contributing a percentage to the overall operating capacity of the target. Once all the buildings are bombed to rubble, the site is no longer operative. For example, a factory is made up of four large buildings and one small building. Get them all and the factory is destroyed.

- The most important strategy in defending against bomber attacks is to make the bombers turn around. Shooting them down is secondary. Your mission score is affected by the weight of the bombs that hit as well as by how many planes you shoot down. The medium bombers are the most important to stop. They carry a larger bombload than the Stukas. These are good lessons to learn in the simulation, because you have to make the same kind of quick decisions the pilots had to make under the extreme pressures of combat. Pilots usually didn't have long turning battles that lasted 10 minutes. The skies were full of aircraft, and that's what I'm trying to simulate—a large complex battle, not just lone one-on-one engagements.

The likelihood that a bomber will hit its target is somewhat random, but it greatly increases with more skilled crew members. Top Aces are likely to hit almost all the time if nobody interferes. Generally there's a better-than-even chance they'll hit, even with ordinary crew.

Bombing is one of the most difficult skills to perfect in BOB. The target is quite small, usually just a 100' by 100' area. If a bomber is flying at 200 miles an hour, straight and level, at a certain altitude, the window in which to drop their bombload for an accurate hit is less than one second. Because of the heat of battle, the bombardier does not always drop his bombload at the correct instant. This often causes the bombs to fall wide of their mark. The Stuka dive bomber will try evasive maneuvers to save their skins, whereas the medium bombers fly steady on their bomb run no matter how you attack them

The other important thing about the bombers is the angle at which you approach and attack them Remember where the gunners are positioned in each different bomber so you can avoid

their concentration of fire. The aircraft reference section in the manual points out these locations. One of the tactics people probably don't use enough, because it is very difficult, is attacking from out of the sun. If you fly your plane so that it is positioned between the sun and the gunner of the target plane, then the gunner will be blinded by the sun and won't fire until you get very close and actually start hitting the plane.

- I must confess that the greatest inaccuracy in BOB concerns the amount of firing time you have . In reality the Spitfire and the 109 had about 8 seconds worth of firing; you have much more firing time actually playing the simulation. Admittedly this was a concession to making a more entertaining product. To accurately simulate a British fighter mission would have gone something like this: You take off and climb up to your combat air patrol height—this takes you 20 minutes. Then you wait up there for an hour or more hoping to see an enemy aircraft to intercept. More often than not you don't see anyone. If you are very lucky and actually maneuver into firing position you have only 8 seconds worth of ammunition. Unfortunately, simulating it just this way wouldn't be very exciting. What I've done is remove the boring parts of a mission as much as possible and enhance the exciting parts.

- Another aspect of the BOB that is not perfectly accurate is the AI of the attackers; they are much more persistent than they would be in real life. Sometimes they're quite fanatical in that they'll press their attack until either they shoot you down or they get shot down .

- In reference to aerial tactics, certain aircraft, if attacked by other aircraft, won't go into specific maneuvers if they know they have no chance of being successful. For example a Spitfire or a Hurricane will not go into a dive to avoid a 109. What the program does is figure out in 3D space what aircraft is attacking and from what quarter, i.e. what angle it's attacking from. It also figures out whether it's being attacked from above, the same level, or below. Based on these positions, the aircraft will choose one of various evasive maneuvers that will have the best chance of success. The pilots with the higher skill make better, more responsive decisions.

- As far as basic misson design is concerned, I admit that I enjoy creating very difficult, if not impossible missions. I think the advanced players like the challenge of winning these missions. I included a mission builder so that when players have mastered the best that I can throw at them, they can use their ingenuity to challenge themselves and their friends with their own creations.

- In the scoring of the missions, I try to instill the idea that it's a group effort. Therefore, if you're the leader and some of your wingmen get shot down, it greatly affects your score. More importantly if you're a wingman and your leader gets shot, that's very bad news because one of your main responsibilities as a wingman is to protect your leader. Bomber groups score based on the damage done by the group. The more damage your fellow flight group members do, the better score you'll achieve. Also, the quality of the opposition and the kind of plane affect the score you get for aerial victories.

- Here's a little known fact about BOB: there's a very subtle color coding scheme used for identifying the quality of Bf 109 pilots. Top Aces have pink or bright red noses while Aces have yellow. All other pilots have white noses painted on their aircraft. There's a great story from the Eastern Front about Erich Hartmann, the Blonde Knight of Germany, the top scoring ace in

aviation history with 352 aerial victories. He had his plane eventually painted with a black nose—it was very distinctive. The Russians eventually realized who he was and stayed far away. This dissatisfied him greatly because he wanted to increase his air victory totals. So what he decided to do was to put the rookie wingmen who were getting shot down with frightening regularity in a plane with a black nose. Soon the wingmen were having much better survival rates as the Russian pilots stayed away from them thinking they were Erich Hartmann.

- Another point about air tactics: it's very important to keep track of where all the flight groups are and what type of planes they contain; this is information you need to decide who and when to attack. Certainly using the wealth of information available from the In-Flight Map to keep track of where all aircraft are is absolutely necessary. Just like in real combat, knowing where the enemy is and not letting yourself be surprised is vital. Oftentimes enemy planes will come in from very low or high, so while you're concentrating on a couple of aircraft in front of you, suddenly there'll be a flight group of aircraft that will bounce you seemingly from out of thin air. These flight groups of aircraft—that's what I call them as a general term, planes that fly together—have been constantly refined from Battlehawks to BOB and now to SWOTL. Now they work as a unit just like in an historically accurate pairing or finger-4 formation.

- In BOB, if you maneuvered quickly your wingmen would not follow you very closely. They would eventually catch up with you, but they just weren't very good at covering your tail or keeping with you in formation. In SWOTL your wingmen follow you like glue. Keeping your flight group together and in tight formation is very important. While some combat is still one-on-one, you really want to keep your flight group together to get to a ground attack site because flying alone against all the enemy defenses means that they are all concentrating on you. You're most likely going to get shot down very quickly. If you go there with a larger group it spreads out their defenses. Likewise if there are any interceptors in the area, staying with the group is one of the smartest things to do in the game. As you look at the In-Flight Map, you really want to keep an eye on all these different flight groups. You'll see individual planes but they'll always be clustered together. There's a maximum of six planes that can operate in a flight group. The whole concept of creating missions is based on these individual flight groups.

RDM: Does your performance affect the performance of your wingmen and other friendly aircraft?

Only in the sense that if you protect him from getting shot down, then you're going to make him survive and allow him to gain experience points. Probably the best way to build a flight group is to fly a plane with a pilot in it, build his record up to be as high as possible, by getting at least 20 aerial victories, then use that pilot in one of your wingmen's planes. It's hard when a pilot that you invested a lot of time in gets shot down, but it adds to the drama and realism of the action. Of course you can back up your pilots at the DOS command line.

There are basic strategies in the game that are really common, no matter what area you're flying in. Altitude is usually the advantage you want because it translates into speed. For instance if you're an American pilot and trying to attack a German jet who has superior speed in level flight, the only hope for a successful attack is to gain altitude and dive. Also you have to realize that in some cases you're not going to able to carry out a successful attack. If you don't

have the advantage, wait for another day or look for another target that you do have an advantage over.

RDM: In that sense, then, flying a campaign or a tour of duty, like in real life, is a case somewhat of luck and circumstance and if you find yourself in a position where you have the advantage, take advantage of it. If not, rather than get shot down, your're probably better off doing whatever you need to do to survive. I remember reading some accounts from Adolf Galland where he talks about just that sort of situation. He and some other experienced pilots came across a group of RAF pilots and could see at a glance that they would be able to shoot down a few, but that they would most likely not be able to survive the battle. They took the prudent course and waited for another day.

- Right, don't go after tempting targets that are really not within your tactical area of engagement. Sometimes you have to let opportunities go without a fight. I tried to capture this aspect in the SWOTL campaign where the action is more spread out. You cannot be in every place at once and you have to rely on your defenses to do some of the intercepts.

- I think one of the nicest upgrades in SWOTL is handling the characteristics of the aircraft; there is more accurate flight modeling and we added more differences between planes—and I gave more attention to emphasizing those differences that can be crucial in combat.

- By the way, all aircraft in a mission will complete the entire mission. That means that bombers will eventually fly all the way back to their bases in England. Fighters on combat air patrol will circle their areas until they run low on fuel, then they'll head home.

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